

# NAVAL AIR WARFARE CENTER WEAPONS DIVISION

Point Mugu,  
CA 93042-5001

NAWCWPNS TP 8065

DECEMBER 1994



## Tidal and Lunar Data for Point Mugu, San Nicolas Island, and the Barking Sands Area During 1995

by  
Charles Fisk  
and  
Bernard Cohenour  
Geophysics Analysis Section



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# NAVAL AIR WARFARE CENTER WEAPONS DIVISION

## FOREWORD

This publication combines a single source for all tidal and lunar data for operational locations of the Naval Air Warfare Center for use in Calendar Year 1995.

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31 December 1994

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13. ABSTRACT (Maximum 200 words)  Basic lunar and tidal data for Point Mugu, San Nicolas Island and the Barking Sands area during 1995 are provided. The data presented are: (1) Tidal data; (2) times of moonrise and moonset; (3) times of lunar phases; and (4) times of sunrise and sunset.				
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## INTRODUCTION

This publication combines a single source for all tidal and lunar data for operational locations of the Naval Air Warfare Center Weapons Division for use in Calendar Year 1995.

The data presentations are in two main divisions: one for Point Mugu and San Nicolas Island, and the other for the Barking Sands area. Within each division, the times of moonrise and moonset and tidal data are given. Appendixes provide information on lunar phases, sunrise and sunset times and calculation of the tide at any time. This publication is issued annually. Information regarding this data may be obtained from the Geophysics Branch of the Pacific Ranges and Facilities Department.

Special tidal data requests (ranges, heights at any time, and/or graphical depictions of each) for Point Mugu, San Nicolas Island, and Barking Sands, as well as for other locations, can be made by contacting the authors of this report at the Naval Air Warfare Center Weapons Division (805) 989-8383.

## DATA SOURCE AND TIME REFERENCES

The data given here have been prepared from information contained in Tide Tables for the West Coast of North and South America including the Hawaiian Islands, 1995, published by the National Ocean Service.

For Point Mugu and San Nicolas Island, all times listed are Pacific Standard Time (PST), add eight hours to obtain Universal Coordinated Time (UCT or Z). When Daylight Savings Time (PDT) is in effect, one hour is to be added to the times given. In 1995, Pacific Daylight Time is scheduled to commence at 0200 PST on Sunday, 2 April, and to end at 0200 PDT on Sunday, 29 October.

For the Barking Sands Area, all times listed are Alaska-Hawaii Standard Time (AHST); add ten hours to obtain UCT. Daylight Savings Time is not observed in Hawaii.

### TIDAL DATA

The ranges of tidal heights that may be expected at Point Mugu and San Nicolas Island are shown in Table 1. The range of heights for the primary harbor in the Barking Sands area, Port Allen, is shown in Table 2. The times and height of high and low tides for 1995 at Point Mugu are given in Tables 4 through 15, and at San Nicolas Island in Tables 16 through 27. Similar tide data for Port Allen are given in Tables 29 through 40.

**TABLE 1. Tidal Ranges for Point Mugu and San Nicolas Island**

Point Mugu		
Tidal Levels	Height (Ft)	Occurrence
Extreme high water	6.84	0842, Dec 22
Mean tide level (mean sea level)	2.74	
Extreme low water	-1.67	1542, Jan 01
Tidal Ranges	Height (Ft)	Occurrence(s)
Maximum	8.48	Jan 01, Dec 22
Minimum	1.84	Sep 18

San Nicolas Island		
Tidal Levels	Height (Ft)	Occurrence
Extreme high water	6.27	0848, Dec 22
Mean tide level (mean sea level)	2.51	
Extreme low water	-1.53	1548, Jan 01
Tidal Ranges	Height (Ft)	Occurrence(s)
Maximum	7.77	Jan 01, Dec 22
Minimum	1.69	Sep 18

**TABLE 2. Tidal Ranges for Port Allen**

Tidal Levels	Height (Ft)
Extreme high water	2.3
Mean higher high water	1.6
Mean high water	1.0
Mean tide level (mean sea level)	0.7
Mean low water	0.5
Mean lower low water	-0.1
Extreme low water	-0.3

These tables list the times and heights of high and low tide for each month of the year and chronologically through each day. The heights are all measured from mean lower low water and are values for a sea unaffected by wind waves or swell. The height and character of the sea surface are influenced by factors other than the predictable positions of the moon and sun, and thus are likely to be higher or lower than computed values indicate.

### LUNAR DATA

Times of moonrise and moonset for the Point Mugu-San Nicolas Island area in 1995 are given in Table 3, and for the Barking Sands area in Table 28, preceding the tidal data for the respective stations. Information regarding the phases of the moon in 1995 is found in Appendix B.

TABLE 3. Moonrise and Moonset, Point Mugu, 1995

Astronomical Applications Dept.  
U.S. Naval Observatory  
Washington, D.C. 20392-5420

Point Mugu, California  
Rise and Set for the Moon for 1995  
Pacific Standard Time

Location: W119 07', N34 07'

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Day	Rise h m	Set h m	Rise h m	Set h m	Rise h m	Set h m	Rise h m	Set h m	Rise h m	Set h m	Rise h m	Set h m
01	0701 1744	0745 1943	0617 1827	0633 2006	0628 2039	0736 2138	0815 2129	1002 2150	1207 2248	1256 2341	1351 0045	1340 0141
02	0751 1852	0821 2043	0651 1927	0710 2101	0712 2128	0830 2216	0912 2203	1104 2229	1308 2344	1346	1427 0147	1415 0239
03	0835 1957	0854 2142	0725 2025	0749 2154	0759 2215	0925 2252	1009 2237	1207 2311	1406	1431 0045	1502 0247	1451 0336
04	0915 2100	0928 2238	0800 2122	0831 2245	0849 2258	1021 2327	1108 2311	1311 2359	1500 0044	1512 0149	1538 0347	1530 0432
05	0950 2200	1002 2334	0835 2217	0917 2333	0942 2338	1118	1209 2348	1414	1549 0148	1550 0252	1614 0445	1612 0527
06	1024 2259	1038	0913 2311	1005	1036	1217 0001	1312	1517 0052	1634 0254	1627 0354	1652 0542	1656 0619
07	1056 2355	1116 0028	0953	1057 0019	1132 0016	1318 0035	1417 0029	1615 0152	1715 0400	1703 0456	1732 0639	1743 0709
08	1129	1158 0121	1036 0003	1150 0101	1230 0052	1422 0112	1523 0114	1709 0256	1753 0505	1739 0556	1815 0733	1833 0756
09	1203 0050	1242 0213	1123 0053	1246 0141	1329 0127	1528 0151	1629 0206	1758 0403	1830 0608	1816 0655	1900 0825	1924 0840
10	1240 0144	1331 0302	1213 0140	1344 0219	1431 0202	1636 0235	1732 0305	1841 0511	1906 0710	1855 0752	1948 0914	2017 0920
11	1319 0238	1423 0349	1307 0225	1445 0255	1535 0239	1744 0326	1830 0409	1921 0618	1943 0810	1936 0848	2039 0959	2111 0957
12	1402 0330	1519 0432	1403 0307	1547 0331	1642 0318	1850 0422	1922 0517	1959 0723	2020 0908	2020 0942	2131 1041	2205 1032
13	1449 0421	1616 0514	1501 0347	1651 0408	1751 0401	1951 0525	2008 0626	2035 0826	2100 1005	2107 1032	2224 1120	2300 1106
14	1539 0509	1716 0552	1601 0424	1758 0446	1901 0449	2046 0632	2049 0733	2110 0926	2142 1059	2156 1120	2319 1157	2357 1139
15	1633 0555	1816 0629	1703 0501	1906 0528	2008 0543	2134 0740	2127 0839	2146 1025	2227 1151	2247 1204	2322	1213
16	1729 0638	1918 0705	1806 0537	2015 0613	2110 0643	2216 0848	2203 0941	2224 1121	2314 1240	2340 1245	0014 1306	0056 1248
17	1827 0717	2021 0741	1911 0615	2122 0703	2207 0747	2254 0952	2237 1041	2304 1216	2326	1323	0112 1340	0157 1327
18	1926 0754	2125 0818	2018 0654	2225 0759	2256 0853	2329 1055	2312 1140	2347 1309	0004 1409	0035 1400	0211 1416	0301 1410
19	2026 0830	2229 0856	2124 0736	2323 0859	2339 0959	1154	2348 1236	1400	0057 1450	0131 1435	0313 1454	0407 1459
20	2127 0905	2334 0938	2231 0822	1002	1103	0003 1252	1331	0033 1447	0151 1528	0228 1510	0417 1536	0513 1555
21	2229 0940	1024	2334 0912	0014 1106	0018 1204	0037 1348	0026 1425	0121 1532	0247 1604	0328 1546	0524 1623	0619 1657
22	2332 1016	0039 1116	1008	0059 1209	0054 1304	0111 1443	0107 1516	0213 1614	0345 1639	0430 1623	0632 1717	0720 1803
23	0037 1055	0140 1212	0034 1107	0140 1310	0128 1401	0147 1538	0150 1606	0306 1654	0444 1715	0534 1703	0738 1816	0816 1913
24	0037 1138	0238 1312	0128 1209	0217 1410	0201 1458	0226 1630	0237 1653	0402 1731	0545 1751	0639 1748	0840 1920	0905 2021
25	0142 1226	0331 1415	0216 1312	0251 1509	0234 1554	0308 1721	0327 1736	0459 1807	0647 1829	0746 1837	0937 2026	0949 2128
26	0246 1320	0419 1520	0300 1414	0325 1606	0309 1648	0353 1810	0420 1817	0557 1841	0751 1910	0852 1932	1027 2132	1029 2232
27	0349 1419	0502 1624	0339 1516	0358 1703	0347 1742	0441 1855	0514 1855	0656 1916	0855 1955	0954 2031	1122 2238	1106 2334
28	0447 1523	0541 1726	0415 1616	0433 1759	0426 1835	0532 1938	0610 1931	0756 1952	1000 2045	1052 2134	1152 2341	1142
29	0539 1629		0450 1715	0509 1854	0509 1925	0625 2017	0707 2006	0858 2030	1102 2140	1144 2238	1229	1217 0033
30	0626 1736		0524 1813	0547 1947	0556 2012	0720 2054	0804 2040	1000 2111	1201 2239	1231 2342	1305 0042	1253 0131
31	0707 1840		0558 1910		0645 2057		0903 2114	1103 2157		1312		1331 0227

Add one hour for daylight time, if and when in use.



TABLE 4. Point Mugu Tides, January 1995

January 1995

Mugu Lagoon (Ocean Piers), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet.

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht
01	8.48	0224	1.51	0824	6.81	1542	-1.67
02	8.06	0312	1.47	0912	6.59	1624	-1.47
03	7.24	0354	1.50	0954	6.15	1706	-1.09
04	6.09	0454	1.61	1042	5.53	1748	-0.56
05	4.74	0012	4.41	0548	1.77	1130	4.78
06	3.73	0106	4.39	0654	1.91	1224	4.00
07	3.14	0154	4.38	0824	1.93	1336	3.27
08	2.73	0254	4.43	1006	1.70	1524	2.79
09	3.29	0354	4.54	1130	1.25	1724	2.73
10	3.96	0448	4.72	1230	0.76	1848	2.92
11	4.57	0542	4.94	1306	0.38	1924	3.15
12	5.17	0612	5.18	1342	0.01	2000	3.34
13	5.69	0042	2.12	0648	5.41	1412	-0.28
14	6.10	0118	2.02	0718	5.60	1442	-0.50
15	6.37	0154	1.91	0754	5.73	1512	-0.64
16	6.47	0224	1.81	0830	5.77	1536	-0.70
17	6.37	0254	1.73	0854	5.71	1606	-0.66
18	6.03	0336	1.68	0936	5.53	1636	-0.51
19	5.46	0418	1.67	1012	5.20	1706	-0.25
20	4.64	0506	1.69	1048	4.74	1736	0.10
21	3.77	0006	4.31	0554	1.72	1130	4.16
22	3.41	0048	4.42	0712	1.69	1230	3.51
23	3.09	0142	4.57	0848	1.49	1406	2.96
24	3.79	0248	4.79	1024	0.99	1612	2.79
25	4.79	0354	5.11	1142	0.32	1754	3.02
26	5.86	0506	5.51	1236	-0.34	1854	3.39
27	6.81	0554	5.92	1324	-0.88	1942	3.76
28	7.50	0042	1.65	0654	6.25	1406	-1.25
29	7.82	0136	1.39	0742	6.42	1448	-1.40
30	7.75	0218	1.16	0824	6.40	1524	-1.35
31	7.29	0306	1.01	0900	6.17	1554	-1.11

TABLE 5. Point Mugu Tides, February 1995

February 1995

Mugu Lagoon (Ocean Piers), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet.

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht
01	6.48	0348	0.97	0942	5.75	1636	-0.72
02	5.40	0436	1.04	1024	5.18	1706	-0.22
03	4.17	0524	1.20	1106	4.51	1742	0.34
04	2.89	0618	1.40	1154	3.81	1812	0.92
06	2.64	0142	4.23	0854	1.59	1430	2.63
07	2.86	0248	4.18	1048	1.33	1706	2.57
08	3.37	0354	4.27	1154	0.90	1836	2.83
09	4.01	0454	4.49	1242	0.48	1918	3.11
10	4.66	0554	4.77	1318	0.11	1936	3.35
11	5.26	0030	2.12	0624	5.06	1348	-0.20
12	5.74	0106	1.87	0700	5.32	1412	-0.42
13	6.07	0142	1.60	0736	5.50	1442	-0.57
14	6.20	0218	1.34	0818	5.58	1506	-0.62
15	6.10	0248	1.11	0848	5.54	1536	-0.55
16	5.72	0330	0.93	0924	5.35	1606	-0.37
17	5.07	0406	0.81	1006	5.01	1636	-0.06
18	4.45	0454	0.78	1048	4.51	1706	0.35
19	3.09	0548	0.81	1136	3.91	1742	0.84
20	3.92	0006	4.80	0654	0.88	1236	3.28
21	3.93	0100	4.76	0824	0.84	1418	2.82
22	4.21	0212	4.76	1006	0.55	1630	2.83
23	4.81	0330	4.88	1124	0.07	1754	3.18
24	5.55	0448	5.16	1218	-0.39	1848	3.59
25	6.21	0554	5.47	1306	-0.74	1930	3.97
26	6.63	0048	1.43	0648	5.71	1348	-0.92
27	6.74	0136	1.03	0736	5.81	1424	-0.93
28	6.53	0218	0.71	0818	5.74	1454	-0.79

TABLE 6. Point Mugu Tides, March 1995

March 1995

Mugu Lagoon (Ocean Piers), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht
01	6.02	0254	0.49	0854	5.51	1530	-0.51
02	5.27	0336	0.40	0930	5.13	1554	-0.13
03	4.49	0418	0.43	1006	4.66	1630	0.31
04	4.08	0454	0.57	1048	4.12	1654	0.79
05	3.66	0542	0.78	1130	3.56	1724	1.28
06	2.00	0636	1.02	1230	3.02	1748	1.74
07	3.00	0024	4.21	0748	1.20	1354	2.60
08	2.80	0118	3.99	0930	1.19	1648	2.59
09	2.96	0242	3.90	1054	0.93	1812	2.88
10	3.41	0412	4.01	1154	0.60	1842	3.17
11	3.99	0512	4.27	1236	0.28	1906	3.46
12	4.55	0012	2.02	0554	4.57	1306	0.02
13	5.01	0048	1.61	0636	4.84	1336	-0.17
14	5.33	0124	1.18	0712	5.05	1354	-0.28
15	5.44	0154	0.76	0754	5.15	1430	-0.29
16	5.32	0236	0.37	0836	5.13	1454	-0.19
17	5.15	0318	0.07	0918	4.95	1530	0.03
18	5.42	0354	-0.12	0954	4.63	1554	0.37
19	5.46	0448	-0.18	1048	4.17	1636	0.78
20	5.24	0542	-0.10	1148	3.66	1718	1.26
21	3.14	0648	0.06	1254	3.19	1806	1.74
22	4.74	0030	4.90	0806	0.17	1442	2.98
23	4.56	0142	4.67	0936	0.11	1624	3.16
24	4.68	0312	4.59	1054	-0.09	1730	3.54
25	4.98	0436	4.69	1154	-0.29	1818	3.94
26	5.26	0542	4.86	1242	-0.39	1854	4.31
27	5.37	0048	1.06	0642	4.98	1318	-0.38
28	5.26	0130	0.61	0724	4.99	1354	-0.26
29	5.07	0212	0.27	0806	4.89	1424	-0.04
30	5.06	0248	0.04	0848	4.70	1454	0.24
31	5.16	0324	-0.07	0924	4.42	1518	0.57

TABLE 7. Point Mugu Tides, April 1995

April 1995

Mugu Lagoon (Ocean Piers), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht
01	5.07	0354	-0.07	0954	4.09	1548	0.93
02	4.80	0436	0.03	1036	3.72	1612	1.29
03	4.39	0518	0.21	1118	3.33	1642	1.66
04	3.88	0606	0.45	1218	2.98	1706	2.02
05	2.05	0654	0.68	1342	2.73	1742	2.35
06	3.21	0012	4.04	0818	0.83	1554	2.76
07	2.97	0124	3.78	0942	0.81	1712	3.02
08	3.02	0254	3.68	1048	0.66	1748	3.32
09	3.31	0424	3.79	1130	0.48	1812	3.65
10	3.69	0524	4.01	1212	0.33	1836	4.01
11	4.19	0024	1.37	0612	4.25	1242	0.22
12	4.65	0106	0.78	0654	4.45	1318	0.18
13	5.02	0142	0.21	0736	4.57	1348	0.22
14	5.86	0224	-0.31	0818	4.58	1424	0.35
15	6.47	0306	-0.70	0912	4.46	1454	0.57
16	6.77	0354	-0.94	0954	4.24	1536	0.88
17	6.70	0442	-0.98	1054	3.93	1612	1.24
18	6.29	0536	-0.86	1154	3.61	1654	1.63
19	4.02	0636	-0.63	1312	3.39	1806	2.01
20	5.40	0012	5.03	0748	-0.38	1442	3.39
21	4.79	0130	4.60	0906	-0.19	1554	3.62
22	4.38	0248	4.30	1012	-0.08	1654	3.97
23	4.33	0418	4.19	1112	0.01	1742	4.34
24	4.54	0524	4.19	1154	0.13	1818	4.67
25	4.63	0042	0.76	0624	4.20	1242	0.30
26	4.81	0124	0.31	0718	4.17	1318	0.51
27	5.27	0206	-0.02	0754	4.09	1348	0.75
28	5.55	0242	-0.25	0842	3.97	1418	1.00
29	5.66	0312	-0.37	0918	3.82	1442	1.25
30	5.60	0348	-0.40	0954	3.64	1512	1.50

TABLE 8. Point Mugu Tides, May 1995

May 1995		
Mugu Lagoon (Ocean Piers), CA		
34° 06.0' North, 119° 06.0' West		
Tidal range, highs, and lows in feet		
Pacific Standard Time - Add one hour for Daylight Savings Time		
Date	Range Time	Ht
01	5.40	0424 -0.34
02	5.04	0454 -0.20
03	4.58	0542 -0.01
04	4.04	0630 0.21
05	2.66	0724 0.41
06	3.36	0824 0.55
07	2.99	0912 0.62
08	3.27	1006 0.66
09	3.69	1054 0.67
10	4.14	1142 0.69
11	4.82	1224 0.74
12	5.95	1306 0.81
13	6.89	1348 0.93
14	7.52	1412 1.10
15	7.77	1454 1.30
16	7.59	1512 1.55
17	7.03	1554 1.82
18	6.18	1654 2.06
19	4.52	1754 2.18
20	4.79	1824 2.18
21	4.23	1854 2.05
22	4.20	1924 1.66
23	4.18	1954 1.15
24	4.50	2024 0.94
25	5.08	2054 0.81
26	5.51	2124 0.74
27	5.80	2154 0.64
28	5.95	2204 0.54
29	5.96	2234 0.49
30	5.84	2254 0.42
31	5.57	2304 0.34

TABLE 9. Point Mugu Tides, June 1995

June 1995		
Mugu Lagoon (Ocean Piers), CA		
34° 06.0' North, 119° 06.0' West		
Tidal range, highs, and lows in feet		
Pacific Standard Time - Add one hour for Daylight Savings Time		
Date	Range Time	Ht
01	5.16	0518 -0.29
02	4.64	0554 -0.09
03	4.02	0642 0.14
04	3.26	0724 0.38
05	3.28	0812 0.63
06	3.42	0906 0.86
07	3.68	0954 1.06
08	4.02	1048 1.20
09	5.41	1142 1.31
10	6.58	1230 1.37
11	7.52	1318 1.42
12	8.12	1406 1.46
13	8.29	1454 1.52
14	8.00	1548 1.62
15	7.30	1648 1.76
16	6.26	1748 1.90
17	4.86	1848 2.03
18	4.49	1948 2.15
19	4.06	2048 2.25
20	3.78	2148 2.35
21	3.59	2248 2.45
22	4.47	2348 2.55
23	5.03	0006 2.65
24	5.49	0054 2.75
25	5.83	0142 2.85
26	6.06	0230 2.95
27	6.15	0318 3.05
28	6.10	0406 3.15
29	5.88	0454 3.25
30	5.49	0542 3.35

TABLE 10. Point Mugu Tides, July 1995

July 1995

Mugu Lagoon (Ocean Piers), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht
01	4.93	0524	-0.13	1154	3.85	1654	2.31
02	4.22	0554	0.14	1236	3.95	1754	2.35
03	3.64	0636	0.46	1318	4.10	1906	2.32
04	3.50	0018	3.84	0712	0.83	1412	4.33
05	3.44	0142	3.34	0754	1.20	1506	4.63
06	4.07	0324	3.03	0854	1.52	1554	5.03
07	3.74	0506	3.04	1006	1.74	1654	5.48
08	5.73	0018	0.23	0624	3.28	1112	1.83
09	6.84	0106	-0.45	0724	3.59	1212	1.79
10	7.69	0154	-1.00	0812	3.90	1306	1.68
11	8.18	0236	-1.36	0848	4.16	1354	1.55
12	8.22	0318	-1.49	0936	4.38	1448	1.45
13	7.80	0406	-1.40	1018	4.54	1542	1.42
14	6.97	0448	-1.11	1106	4.64	1636	1.47
15	5.82	0524	-0.65	1154	4.69	1370	1.58
16	4.77	0606	-0.07	1242	4.70	1836	1.71
17	4.15	0012	4.42	0654	0.54	1330	4.70
18	3.56	0124	3.70	0736	1.15	1430	4.71
19	3.41	0254	3.16	0830	1.68	1530	4.77
20	3.95	0442	2.97	0936	2.07	1618	4.89
21	2.78	0606	3.08	1042	2.29	1712	5.06
22	4.71	0048	0.55	0706	3.29	1142	2.35
23	5.23	0130	0.22	0748	3.48	1230	2.31
24	5.65	0154	-0.03	0824	3.64	1306	2.22
25	5.95	0230	-0.20	0848	3.79	1342	2.10
26	6.10	0254	-0.31	0918	3.93	1418	1.99
27	6.07	0324	-0.34	0942	4.07	1448	1.90
28	5.85	0354	-0.29	1012	4.19	1524	1.84
29	5.43	0418	-0.15	1042	4.30	1606	1.81
30	4.79	0448	0.09	1106	4.40	1648	1.81
31	4.09	0518	0.41	1136	4.50	1736	1.83

TABLE 11. Point Mugu Tides, August 1995

August 1995

Mugu Lagoon (Ocean Piers), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht
01	3.80	0548	0.80	1218	4.61	1842	1.82
02	3.49	0006	3.81	0630	1.24	1306	4.73
03	3.53	0124	3.27	0712	1.68	1412	4.89
04	4.36	0324	2.99	0824	2.05	1518	5.15
05	3.27	0512	3.13	0948	2.25	1630	5.52
06	5.77	0006	0.17	0624	3.47	1106	2.19
07	6.71	0054	-0.39	0712	3.86	1212	1.96
08	7.37	0136	-0.80	0754	4.22	1306	1.65
09	7.65	0218	-1.02	0830	4.55	1354	1.35
10	7.51	0254	-1.03	0906	4.80	1442	1.13
11	6.96	0336	-0.84	0942	4.98	1530	1.01
12	6.07	0412	-0.48	1018	5.07	1618	1.02
13	5.06	0448	0.00	1106	5.06	1706	1.14
14	4.40	0524	0.57	1142	4.98	1754	1.33
15	3.66	0554	1.17	1230	4.83	1906	1.53
16	3.07	0054	3.58	0642	1.74	1318	4.67
17	3.11	0224	3.10	0730	2.24	1424	4.57
18	3.46	0436	3.01	0848	2.60	1536	4.59
19	2.04	0606	3.23	1018	2.71	1636	4.75
20	4.21	0018	0.78	0648	3.49	1130	2.60
21	4.76	0054	0.48	0718	3.72	1218	2.40
22	5.22	0130	0.24	0742	3.93	1254	2.15
23	5.53	0154	0.07	0806	4.14	1330	1.89
24	5.69	0224	-0.02	0836	4.35	1354	1.64
25	5.66	0248	-0.03	0854	4.56	1436	1.42
26	5.41	0318	0.04	0924	4.74	1512	1.24
27	4.94	0342	0.22	0954	4.90	1548	1.12
28	4.53	0412	0.50	1024	5.02	1630	.07
29	4.23	0442	0.86	1048	5.09	1724	1.09
30	3.95	0512	1.29	1130	5.10	1824	1.15
31	3.91	0012	3.68	0554	1.75	1218	5.06

TABLE 12. Point Mugu Tides, September 1995

September 1995			
Mugu Lagoon (Ocean Piers), CA			
34° 06.0' North, 119° 06.0' West			
Tidal range, highs, and lows in feet			
Pacific Standard Time - Add one hour for Daylight Savings Time			
Date	Range	Time	Ht
01	4.07	0142 3.24	0642 2.20
02	4.53	0342 3.17	0812 2.53
03	5.21	0518 3.48	0954 2.55
04	3.40	0618 3.88	1112 2.26
05	6.17	0036-0.23	0654 4.30
06	6.54	0118-0.45	0730 4.68
07	6.57	0154-0.49	0806 5.01
08	6.25	0230-0.37	0830 5.26
09	5.64	0306-0.10	0906 5.41
10	5.17	0336-0.28	0936 5.44
11	4.73	0406 0.73	1012 5.37
12	4.34	0436 1.24	1048 5.20
13	3.83	0512 1.74	1124 4.96
14	3.34	0030 3.47	0542 2.22
15	3.03	0206 3.12	0624 2.65
16	3.06	0424 3.15	0754 2.96
17	3.38	0542 3.42	0954 2.97
18	1.84	0618 3.70	1112 2.70
19	4.08	0012 0.72	0642 3.97
20	4.49	0048 0.53	0700 4.24
21	4.78	0118 0.40	0724 4.52
22	4.91	0142 0.35	0748 4.81
23	4.87	0206 0.37	0818 5.09
24	4.87	0236 0.47	0842 5.34
25	5.25	0306 0.67	0912 5.54
26	5.45	0336 0.96	0942 5.65
27	5.41	0406 1.33	1018 5.66
28	5.17	0442 1.75	1054 5.54
29	4.83	0024 3.61	0530 2.18
30	4.58	0200 3.40	0636 2.58
01	4.07	0142 3.24	0642 2.20
02	4.53	0342 3.17	0812 2.53
03	5.21	0518 3.48	0954 2.55
04	3.40	0618 3.88	1112 2.26
05	6.17	0036-0.23	0654 4.30
06	6.54	0118-0.45	0730 4.68
07	6.57	0154-0.49	0806 5.01
08	6.25	0230-0.37	0830 5.26
09	5.64	0306-0.10	0906 5.41
10	5.17	0336-0.28	0936 5.44
11	4.73	0406 0.73	1012 5.37
12	4.34	0436 1.24	1048 5.20
13	3.83	0512 1.74	1124 4.96
14	3.34	0030 3.47	0542 2.22
15	3.03	0206 3.12	0624 2.65
16	3.06	0424 3.15	0754 2.96
17	3.38	0542 3.42	0954 2.97
18	1.84	0618 3.70	1112 2.70
19	4.08	0012 0.72	0642 3.97
20	4.49	0048 0.53	0700 4.24
21	4.78	0118 0.40	0724 4.52
22	4.91	0142 0.35	0748 4.81
23	4.87	0206 0.37	0818 5.09
24	4.87	0236 0.47	0842 5.34
25	5.25	0306 0.67	0912 5.54
26	5.45	0336 0.96	0942 5.65
27	5.41	0406 1.33	1018 5.66
28	5.17	0442 1.75	1054 5.54
29	4.83	0024 3.61	0530 2.18
30	4.58	0200 3.40	0636 2.58

TABLE 13. Point Mugu Tides, October 1995

October 1995			
Mugu Lagoon (Ocean Piers), CA			
34° 06.0' North, 119° 06.0' West			
Tidal range, highs, and lows in feet			
Pacific Standard Time - Add one hour for Daylight Savings Time			
Date	Range	Time	Ht
01	4.58	0348 3.55	0824 2.76
02	4.81	0454 3.92	1006 2.53
03	3.10	0548 4.34	1124 2.03
04	5.23	0006 0.04	0630 4.76
05	5.28	0048 0.04	0706 5.12
06	5.26	0124 0.16	0736 5.42
07	5.41	0154 0.37	0806 5.62
08	5.66	0230 0.66	0830 5.72
09	5.66	0254 1.00	0900 5.71
10	5.43	0330 1.38	0924 5.59
11	5.02	0354 1.76	0954 5.39
12	4.49	0424 2.14	1036 5.12
13	3.90	0018 3.41	0454 2.51
14	3.37	0142 3.22	0536 2.85
15	3.01	0342 3.28	0654 3.12
16	2.93	0454 3.54	0924 3.09
17	3.10	0530 3.83	1048 2.74
18	3.36	0554 4.14	1142 2.27
19	2.73	0612 4.48	1218 1.75
20	4.07	0024 0.77	0636 4.84
21	4.57	0054 0.76	0700 5.22
22	5.44	0124 0.81	0730 5.58
23	6.16	0154 0.93	0806 5.90
24	6.65	0230 1.11	0836 6.13
25	6.85	0306 1.36	0912 6.22
26	6.71	0342 1.67	0954 6.15
27	6.28	0430 2.02	1042 5.90
28	5.65	0042 3.74	0524 2.37
29	4.97	0154 3.72	0642 2.65
30	4.44	0318 3.94	0830 2.66
31	4.14	0424 4.31	1006 2.28
01	4.58	0348 3.55	0824 2.76
02	4.81	0454 3.92	1006 2.53
03	3.10	0548 4.34	1124 2.03
04	5.23	0006 0.04	0630 4.76
05	5.28	0048 0.04	0706 5.12
06	5.26	0124 0.16	0736 5.42
07	5.41	0154 0.37	0806 5.62
08	5.66	0230 0.66	0830 5.72
09	5.66	0254 1.00	0900 5.71
10	5.43	0330 1.38	0924 5.59
11	5.02	0354 1.76	0954 5.39
12	4.49	0424 2.14	1036 5.12
13	3.90	0018 3.41	0454 2.51
14	3.37	0142 3.22	0536 2.85
15	3.01	0342 3.28	0654 3.12
16	2.93	0454 3.54	0924 3.09
17	3.10	0530 3.83	1048 2.74
18	3.36	0554 4.14	1142 2.27
19	2.73	0612 4.48	1218 1.75
20	4.07	0024 0.77	0636 4.84
21	4.57	0054 0.76	0700 5.22
22	5.44	0124 0.81	0730 5.58
23	6.16	0154 0.93	0806 5.90
24	6.65	0230 1.11	0836 6.13
25	6.85	0306 1.36	0912 6.22
26	6.71	0342 1.67	0954 6.15
27	6.28	0430 2.02	1042 5.90
28	5.65	0042 3.74	0524 2.37
29	4.97	0154 3.72	0642 2.65
30	4.44	0318 3.94	0830 2.66
31	4.14	0424 4.31	1006 2.28

TABLE 14. Point Mugu Tides, November 1995

November 1995

Mugu Lagoon (Ocean Piers), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet.

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht
01	4.26	0512	4.71	1124	1.70	1654	4.44
02	4.01	0554	5.10	1218	1.09	1806	4.46
03	4.86	0012	0.62	0630	5.42	1306	0.56
04	5.51	0054	0.83	0706	5.66	1348	0.15
05	5.93	0124	1.07	0736	5.81	1424	-0.13
06	6.13	0154	1.32	0806	5.86	1454	-0.27
07	6.13	0224	1.58	0824	5.84	1536	-0.30
08	5.95	0254	1.83	0854	5.73	1612	-0.22
09	5.61	0324	2.08	0924	5.54	1648	-0.07
10	5.14	0354	2.33	0954	5.29	1730	0.15
11	4.53	0430	2.59	1036	4.97	1812	0.39
12	3.96	0106	3.37	0512	2.84	1112	4.60
13	3.35	0224	3.42	0618	3.04	1206	4.20
14	2.83	0336	3.60	0812	3.06	1318	3.82
15	2.82	0424	3.89	0954	2.74	1454	3.59
16	3.11	0454	4.23	1106	2.21	1618	3.57
17	3.46	0524	4.62	1154	1.58	1724	3.68
18	4.15	0548	5.05	1236	0.90	1818	3.85
19	5.27	0006	1.20	0618	5.51	1318	0.23
20	6.32	0042	1.25	0654	5.95	1354	-0.37
21	7.18	0124	1.32	0730	6.32	1436	-0.86
22	7.74	0154	1.43	0812	6.57	1524	-1.17
23	7.92	0242	1.57	0854	6.64	1606	-1.28
24	7.70	0330	1.75	0936	6.50	1654	-1.19
25	7.09	0424	1.98	1030	6.16	1748	-0.93
26	6.18	0524	4.03	0524	2.21	1124	5.63
27	5.12	0130	4.09	0642	2.38	1218	4.99
28	4.09	0236	4.27	0812	2.34	1336	4.37
29	3.91	0336	4.56	0954	1.99	1512	3.93
30	3.93	0430	4.89	1112	1.43	1636	3.72

TABLE 15. Point Mugu Tides, December 1995

December 1995

Mugu Lagoon (Ocean Piers), CA

34° 06.0' North, 119° 06.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht
01	4.36	0518	5.21	1212	0.84	1754	3.69
02	5.13	0606	5.47	1254	0.34	1854	3.72
03	5.70	0018	1.45	0636	5.66	1342	-0.04
04	6.08	0054	1.64	0712	5.78	1418	-0.30
05	6.29	0130	1.80	0742	5.83	1454	-0.45
06	6.34	0154	1.92	0812	5.83	1524	-0.51
07	6.26	0236	2.03	0836	5.77	1554	-0.49
08	6.03	0306	2.15	0906	5.64	1630	-0.39
09	5.66	0336	2.27	0936	5.43	1706	-0.23
10	5.14	0412	2.42	1006	5.14	1736	-0.01
11	4.50	0018	3.59	0454	2.58	1048	4.76
12	3.76	0112	3.63	0554	2.72	1124	4.32
13	2.97	0154	3.74	0712	2.77	1218	3.83
14	2.81	0254	3.95	0854	2.58	1336	3.37
15	2.89	0342	4.26	1024	2.10	1524	3.09
16	3.23	0424	4.66	1130	1.42	1654	3.09
17	4.45	0506	5.12	1218	0.68	1806	3.28
18	5.69	0542	5.62	1306	-0.06	1900	3.53
19	6.83	0006	1.62	0624	6.11	1348	-0.72
20	7.75	0054	1.59	0706	6.52	1430	-1.24
21	8.33	0148	1.54	0754	6.78	1512	-1.55
22	8.48	0236	1.51	0842	6.84	1554	-1.64
23	8.16	0324	1.53	0930	6.66	1642	-1.50
24	7.39	0418	1.61	1018	6.24	1730	-1.15
25	6.26	0512	1.74	1112	5.61	1812	-0.66
26	4.91	0048	4.44	0624	1.86	1206	4.84
27	3.99	0148	4.52	0748	1.90	1312	4.06
28	3.58	0242	4.65	0924	1.71	1442	3.43
29	3.55	0342	4.83	1054	1.28	1624	3.14
30	4.28	0442	5.04	1154	0.76	1754	3.15
31	4.95	0530	5.24	1254	0.29	1906	3.29

TABLE 16. San Nicolas Island Tides, January 1995

January 1995									
San Nicolas Island, CA									
33° 16.0' North, 119° 30.0' West									
Tidal range, highs, and lows in feet									
Pacific Standard Time - Add one hour for Daylight Savings Time									
Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	7.77	0236	1.38	0836	6.24	1548	-1.53	2212	3.94
02	7.39	0318	1.34	0924	6.04	1630	-1.35	2254	4.01
03	6.64	0406	1.37	1006	5.64	1712	-1.00	2336	4.04
04	5.58	0500	1.47	1054	5.07	1754	-0.52		
05	4.35	0624	4.04	0554	1.62	1136	4.38	1836	0.03
06	3.42	0154	4.02	0836	1.77	1342	3.00	2006	1.14
08	2.50	0254	4.06	1018	1.56	1530	2.56	2054	1.59
09	3.01	0354	4.16	1142	1.15	1730	2.50	2206	1.91
10	3.63	0454	4.32	1242	0.69	1854	2.67	2318	2.06
11	4.19	0548	4.53	1312	0.35	1936	2.89		
12	4.74	0606	1.99	0624	4.75	1348	0.01	2012	3.07
13	5.22	0648	1.94	0654	4.96	1418	-0.26	2042	3.22
14	5.59	0124	1.85	0730	5.13	1448	-0.46	2106	3.35
15	5.84	0200	1.75	0806	5.25	1524	-0.59	2136	3.47
16	5.93	0236	1.66	0836	5.29	1548	-0.64	2154	3.58
17	5.84	0312	1.59	0906	5.24	1618	-0.60	2230	3.68
18	5.53	0348	1.54	0942	5.07	1648	-0.47	2254	3.77
19	5.00	0430	1.53	1018	4.77	1718	0.23	2336	3.86
20	4.25	0518	1.55	1054	4.35	1748	0.09		
21	3.46	0612	3.95	0612	1.57	1142	3.81	1818	0.49
22	3.12	0654	4.05	0718	1.55	1242	3.22	1900	0.93
23	2.83	0154	4.19	0854	1.36	1418	2.71	2000	1.36
24	3.48	0254	4.39	1030	0.91	1624	2.55	2112	1.69
25	4.39	0406	4.68	1154	0.29	1754	2.77	2242	1.81
26	5.37	0512	5.05	1248	-0.31	1906	3.11	2354	1.72
27	6.24	0606	5.43	1336	-0.81	1948	3.44		
28	6.87	0054	1.51	0654	5.73	1418	-1.14	2030	3.74
29	7.17	0148	1.27	0748	5.89	1454	-1.28	2106	3.97
30	7.11	0230	1.06	0830	5.87	1536	-1.24	2142	4.14
31	6.68	0318	0.93	0912	5.66	1606	-1.02	2218	4.24

TABLE 17. San Nicolas Island Tides, February 1995

February 1995									
San Nicolas Island, CA									
33° 16.0' North, 119° 30.0' West									
Tidal range, highs, and lows in feet									
Pacific Standard Time - Add one hour for Daylight Savings Time									
Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	5.94	0354	0.89	0954	5.27	1642	-0.66	2254	4.26
02	4.95	0442	0.96	1036	4.75	1712	-0.20	2330	4.21
03	3.82	0530	1.10	1118	4.14	1748	0.31		
04	3.27	0612	4.12	0624	1.28	1154	3.49	1824	0.84
05	2.65	0654	3.99	0736	1.44	1254	2.88	1854	1.35
06	2.42	0148	3.88	0912	1.45	1436	2.42	1948	1.79
07	2.62	0254	3.83	1054	1.22	1712	2.36	2106	2.12
08	3.09	0406	3.91	1206	0.83	1842	2.60	2242	2.22
09	3.68	0506	4.11	1254	0.44	1924	2.85	2354	2.13
10	4.28	0554	4.37	1324	0.10	1948	3.07		
11	4.82	0636	1.94	0636	4.64	1354	-0.18	2012	3.29
12	5.26	0112	1.71	0712	4.87	1418	-0.39	2036	3.49
13	5.56	0148	1.46	0748	5.04	1448	-0.52	2054	3.70
14	5.68	0224	1.23	0824	5.12	1518	-0.56	2124	3.90
15	5.59	0254	1.02	0854	5.08	1548	-0.51	2154	4.08
16	5.24	0342	0.85	0930	4.91	1618	-0.34	2218	4.23
17	4.64	0418	0.74	1012	4.59	1648	-0.05	2254	4.34
18	4.08	0506	0.71	1054	4.13	1718	0.32	2330	4.40
19	2.83	0554	0.75	1142	3.58	1754	0.77		
20	3.60	0612	4.40	0706	0.80	1248	3.00	1830	1.24
21	3.60	0112	4.37	0830	0.77	1430	2.59	1930	1.69
22	3.86	0224	4.36	1012	0.50	1642	2.59	2100	1.98
23	4.41	0342	4.48	1130	0.07	1806	2.92	2242	1.95
24	5.09	0454	4.73	1230	-0.36	1854	3.29	2354	1.68
25	5.69	0554	5.01	1318	-0.68	1936	3.64		
26	6.08	0654	1.31	0654	5.23	1354	-0.85	2006	3.95
27	6.18	0148	0.94	0742	5.32	1436	-0.86	2042	4.19
28	5.98	0230	0.65	0824	5.26	1512	-0.72	2112	4.37

TABLE 18. San Nicolas Island Tides, March 1995

March 1995

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht		
01	5.52	0312	0.45	0854	5.05	1542	-0.47	2142	4.46
02	4.83	0348	0.37	0942	4.71	1606	-0.12	2212	4.47
03	4.11	0424	0.40	1018	4.27	1636	0.29	2242	4.40
04	3.74	0506	0.52	1054	3.78	1700	0.73	2312	4.26
05	3.36	0548	0.71	1142	3.26	1730	1.17	2348	4.07
06	1.84	0642	0.93	1236	2.77	1754	1.60		
07	2.75	0030	3.85	0754	1.10	1406	2.39	1830	1.98
08	2.57	0124	3.66	0942	1.09	1654	2.37	1942	2.30
09	2.72	0248	3.57	1112	0.85	1818	2.64	2212	2.98
10	3.13	0418	3.68	1206	0.55	1848	2.91	2330	2.17
11	3.66	0518	3.92	1248	0.26	1912	3.17		
12	4.17	0024	1.85	0606	4.19	1312	0.02	1930	3.44
13	4.60	0054	1.48	0648	4.44	1342	-0.15	1954	3.72
14	4.88	0130	1.08	0724	4.63	1406	-0.25	2018	4.02
15	4.99	0206	0.70	0806	4.72	1436	-0.26	2042	4.31
16	4.87	0242	0.34	0842	4.70	1512	-0.17	2112	4.56
17	4.72	0330	0.06	0924	4.54	1542	0.03	2142	4.76
18	4.97	0412	-0.11	1006	4.24	1612	0.33	2218	4.85
19	5.00	0454	-0.16	1054	3.83	1648	0.72	2254	4.84
20	4.80	0554	-0.09	1154	3.35	1730	1.15	2342	4.71
21	2.88	0654	0.05	1306	2.93	1818	1.60		
22	4.34	0036	4.49	0818	0.15	1454	2.74	1924	1.97
23	4.18	0154	4.28	0942	0.10	1636	2.90	2112	2.10
24	4.29	0324	4.21	1100	-0.08	1742	3.25	2248	1.86
25	4.57	0448	4.30	1200	-0.26	1830	3.61	2400	1.43
26	4.82	0554	4.46	1254	-0.36	1906	3.95		
27	4.92	0054	0.97	0648	4.57	1330	-0.35	1936	4.24
28	4.82	0142	0.56	0730	4.58	1406	-0.24	2006	4.46
29	4.64	0224	0.24	0812	4.49	1436	-0.04	2036	4.60
30	4.64	0254	0.03	0854	4.30	1506	0.22	2106	4.67
31	4.73	0336	-0.07	0930	4.05	1530	0.52	2130	4.66

TABLE 19. San Nicolas Island Tides, April 1995

April 1995

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	4.65	0412	-0.07	1006	3.74	1554	0.85	2154	4.58
02	4.40	0442	0.02	1048	3.41	1618	1.19	2224	4.43
03	4.03	0524	0.19	1130	3.06	1648	1.52	2254	4.22
04	3.56	0612	0.41	1230	2.73	1712	1.85	2330	3.97
05	1.88	0706	0.62	1348	2.51	1754	2.16		
06	2.94	0018	3.70	0830	0.76	1554	2.53	1906	2.42
07	2.73	0130	3.46	0954	0.74	1718	2.76	2130	2.46
08	2.77	0306	3.38	1054	0.61	1754	3.04	2254	2.18
09	3.04	0430	3.48	1142	0.44	1818	3.34	2354	1.75
10	3.38	0530	3.68	1224	0.30	1842	3.68		
11	3.84	0036	1.25	0618	3.90	1248	0.20	1906	4.04
12	4.26	0112	0.72	0706	4.08	1324	0.17	1930	4.43
13	4.60	0148	0.19	0748	4.19	1354	0.20	1954	4.79
14	5.37	0230	-0.28	0830	4.19	1430	0.32	2030	5.09
15	5.93	0312	-0.64	0918	4.09	1506	0.53	2106	5.29
16	6.20	0406	-0.86	1006	3.88	1548	0.80	2148	5.35
17	6.14	0454	-0.90	1054	3.60	1624	1.14	2230	5.24
18	5.77	0548	-0.79	1206	3.31	1712	1.50	2318	4.98
19	3.69	0648	-0.58	1318	3.11	1818	1.84		
20	4.95	0018	4.61	0754	-0.35	1448	3.11	1942	2.07
21	4.39	0136	4.22	0912	-0.17	1606	3.32	2118	2.02
22	4.02	0254	3.94	1018	-0.08	1706	3.64	2248	1.66
23	3.97	0430	3.84	1118	0.00	1754	3.98	2354	1.17
24	4.16	0536	3.84	1206	0.12	1830	4.28		
25	4.25	0048	0.69	0636	3.85	1254	0.27	1906	4.52
26	4.41	0136	0.29	0724	3.82	1330	0.47	1936	4.70
27	4.83	0218	-0.02	0806	3.75	1354	0.69	1954	4.81
28	5.09	0254	-0.23	0848	3.64	1430	0.92	2030	4.86
29	5.19	0324	-0.34	0924	3.50	1454	1.14	2054	4.85
30	5.14	0354	-0.37	1006	3.34	1524	1.37	2124	4.77



TABLE 20. San Nicolas Island Tides, May 1995

May 1995

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht
01	4.95	0436	-0.31	1048	3.17	1548	1.60
02	4.62	0506	-0.19	1130	2.99	1612	1.84
03	4.20	0548	-0.01	1224	2.84	1648	2.07
04	3.71	0636	0.19	1330	2.76	1730	2.30
05	2.43	0730	0.37	1448	2.81	1848	2.48
06	3.08	0830	0.58	1554	2.99	1954	2.68
07	2.74	0936	0.58	1642	3.27	2042	2.48
08	3.00	1030	0.61	1718	3.60	2118	2.18
09	3.38	1118	0.62	1748	4.00	2248	1.68
10	3.79	1206	0.62	1812	4.43	2312	1.18
11	4.42	1254	0.62	1848	4.87	2348	0.68
12	5.45	1342	0.62	1924	5.28	2384	0.18
13	6.31	1430	0.62	1954	5.59	2412	0.12
14	6.90	1518	0.62	2042	5.77	2442	0.08
15	7.12	1606	0.62	2124	5.77	2472	0.08
16	6.96	1654	0.62	2212	5.59	2502	0.08
17	6.45	1742	0.62	2306	5.22	2532	0.08
18	4.42	1830	0.62	2342	4.72	2562	0.08
19	5.31	1918	0.62	2384	4.27	2592	0.08
20	4.40	2006	0.62	2424	3.75	2622	0.08
21	3.88	2094	0.62	2466	3.25	2652	0.08
22	3.85	2182	0.62	2502	2.76	2682	0.08
23	3.83	2270	0.62	2532	2.28	2712	0.08
24	4.13	2358	0.62	2562	1.80	2742	0.08
25	4.66	2446	0.62	2592	1.32	2772	0.08
26	5.05	2534	0.62	2622	0.84	2802	0.08
27	5.32	2622	0.62	2652	0.36	2832	0.08
28	5.45	2710	0.62	2682	-0.12	2862	0.08
29	5.47	2798	0.62	2712	-0.60	2892	0.08
30	5.35	2886	0.62	2742	-1.08	2922	0.08
31	5.10	2974	0.62	2772	-1.56	2952	0.08

TABLE 21. San Nicolas Island Tides, June 1995

June 1995

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht
01	4.73	0524	-0.26	1206	3.10	1636	2.17
02	4.25	0606	-0.09	1254	3.11	1724	2.31
03	3.68	0648	0.13	1348	3.18	1824	2.41
04	2.99	0730	0.35	1436	3.34	1954	2.39
05	3.01	0854	0.42	1524	3.58	2130	2.12
06	3.14	0936	0.42	1612	3.93	2248	1.62
07	3.37	1012	0.97	1654	4.34	2348	0.98
08	3.69	1054	1.10	1730	4.79		
09	4.96	1130	1.33	1812	5.25		
10	6.03	1206	1.33	1854	5.66		
11	6.90	1254	1.33	1942	5.97		
12	7.44	1342	1.33	2024	6.12		
13	7.60	1430	1.33	2112	6.08		
14	7.34	1518	1.33	2154	5.83		
15	6.69	1606	1.33	2254	5.39		
16	5.74	1654	1.33	2348	4.80		
17	4.46	1742	1.33				
18	4.11	1830	1.33				
19	3.72	1918	1.33				
20	3.46	2006	1.33				
21	3.29	2094	1.33				
22	4.09	2182	1.33				
23	4.61	2270	1.33				
24	5.03	2358	1.33				
25	5.34	2446	1.33				
26	5.55	2534	1.33				
27	5.64	2622	1.33				
28	5.59	2710	1.33				
29	5.39	2798	1.33				
30	5.03	2886	1.33				

TABLE 22. San Nicolas Island Tides, July 1995

July 1995

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht
01	4.52	0530	-0.12	1206	3.53	1706	2.12
02	3.86	0606	0.12	1248	3.62	1800	2.16
03	3.34	0642	0.42	1330	3.76	1912	2.13
04	3.21	0030	3.52	0718	0.76	1418	3.97
05	3.15	0148	3.06	0812	1.10	1512	4.25
06	3.73	0330	2.78	0912	1.39	1606	4.61
07	3.43	0512	2.79	1018	1.60	1654	5.03
08	5.25	0030	0.21	0630	3.01	1124	1.68
09	6.27	0118	-0.41	0730	3.29	1224	1.64
10	7.05	0206	-0.91	0818	3.57	1312	1.54
11	7.50	0242	-1.24	0854	3.82	1406	1.42
12	7.54	0324	-1.37	0948	4.01	1454	1.33
13	7.15	0412	-1.29	1030	4.16	1548	1.30
14	6.39	0454	-1.01	1112	4.25	1648	1.34
15	5.34	0536	-0.59	1154	4.30	1742	1.45
16	4.38	0618	-0.07	1248	4.31	1848	1.57
17	3.81	0018	4.05	0706	0.50	1336	4.30
18	3.26	0130	3.39	0748	1.05	1436	4.31
19	3.13	0254	2.90	0842	1.54	1536	4.37
20	2.59	0448	2.73	0942	1.90	1630	4.48
21	3.78	0006	0.86	0618	2.83	1048	2.10
22	4.32	0054	0.50	0718	3.01	1148	2.16
23	4.80	0136	0.21	0754	3.19	1236	2.12
24	5.18	0206	-0.02	0830	3.34	1318	2.03
25	5.45	0242	-0.19	0854	3.48	1354	1.93
26	5.59	0312	-0.29	0924	3.61	1430	1.82
27	5.56	0336	-0.31	0948	3.73	1454	1.74
28	5.37	0406	-0.27	1018	3.84	1536	1.68
29	4.98	0430	-0.13	1048	3.94	1618	1.66
30	4.40	0454	0.08	1118	4.04	1654	1.66
31	3.75	0524	0.38	1148	4.13	1742	1.68

TABLE 23. San Nicolas Island Tides, August 1995

August 1995

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht
01	3.49	0554	0.73	1230	4.22	1848	1.67
02	3.20	0018	3.49	0636	1.13	1318	4.33
03	3.23	0136	3.00	0718	1.54	1418	4.49
04	3.99	0330	2.74	0836	1.88	1524	4.72
05	3.00	0518	2.87	0954	2.06	1636	5.06
06	5.29	0018	0.16	0630	3.18	1118	2.01
07	6.15	0106	-0.36	0718	3.54	1224	1.80
08	6.75	0148	-0.73	0754	3.87	1318	1.52
09	7.01	0230	-0.93	0842	4.17	1400	1.24
10	6.89	0306	-0.95	0918	4.40	1448	1.03
11	6.38	0342	-0.77	0954	4.57	1536	0.93
12	5.56	0418	-0.44	1030	4.65	1624	0.94
13	4.64	0454	0.00	1112	4.64	1718	1.05
14	4.03	0536	0.53	1148	4.56	1812	1.22
15	3.35	0612	1.07	1236	4.43	1918	1.40
16	2.81	0054	3.28	0654	1.60	1324	4.28
17	2.85	0230	2.84	0742	2.05	1430	4.19
18	3.17	0442	2.75	0854	2.38	1542	4.21
19	1.87	0612	2.96	1024	2.48	1648	4.35
20	3.86	0024	0.72	0654	3.20	1136	2.39
21	4.36	0106	0.44	0730	3.41	1224	2.20
22	4.78	0136	0.22	0754	3.61	1300	1.97
23	5.07	0206	0.06	0818	3.80	1342	1.73
24	5.22	0236	-0.02	0842	3.99	1412	1.50
25	5.18	0254	-0.03	0906	4.18	1448	1.30
26	4.96	0330	0.04	0930	4.35	1524	1.14
27	4.53	0354	0.20	0954	4.49	1554	1.03
28	4.15	0424	0.45	1030	4.60	1642	0.98
29	3.88	0454	0.79	1054	4.66	1730	1.00
30	3.62	0518	1.18	1142	4.67	1830	1.05
31	3.59	0024	3.37	0600	1.60	1230	4.64

TABLE 24. San Nicolas Island Tides, September 1995

September 1995		
San Nicolas Island, CA		
33° 16.0' North, 119° 30.0' West		
Tidal range, highs, and lows in feet		
Pacific Standard Time - Add one hour for Daylight Savings Time		
Date	Range	Time
01	3.73	0154 2.97 0648 2.02 1336 4.61 2124 0.88
02	4.15	0354 2.91 0818 2.32 1454 4.68 2254 0.52
03	4.77	0524 3.19 1006 2.34 1618 4.89 2354 0.12
04	3.11	0624 3.56 1124 2.07 1730 5.18
05	5.65	0048 -0.21 0654 3.94 1230 1.61 1824 5.44
06	5.99	0130 -0.41 0736 4.29 1318 1.21 1912 5.58
07	6.02	0206 -0.45 0812 4.59 1406 0.81 1954 5.57
08	5.73	0242 -0.34 0842 4.82 1442 0.61 2042 5.39
09	5.17	0312 -0.10 0918 4.96 1524 0.47 2124 5.07
10	4.74	0342 0.25 0948 4.99 1606 0.47 2206 4.65
11	4.33	0412 0.67 1024 4.92 1648 0.59 2248 4.16
12	3.98	0442 1.13 1054 4.77 1742 0.79 2336 3.65
13	3.51	0524 1.60 1130 4.54 1836 1.03
14	3.06	0636 3.18 0554 2.04 1212 4.29 1948 1.23
15	2.78	0212 2.86 0636 2.43 1312 4.05 2124 1.27
16	2.80	0430 2.88 0806 2.71 1436 3.91 2248 1.11
17	3.10	0548 3.13 1012 2.72 1554 3.97 2342 0.88
18	1.69	0624 3.39 1118 2.48 1706 4.17
19	3.74	0018 0.66 0654 3.64 1206 2.15 1754 4.40
20	4.12	0054 0.48 0712 3.88 1248 1.79 1836 4.60
21	4.38	0124 0.37 0736 4.14 1318 1.42 1912 4.75
22	4.50	0148 0.32 0754 4.41 1354 1.05 1948 4.82
23	4.46	0218 0.34 0824 4.67 1436 0.72 2024 4.80
24	4.47	0248 0.43 0848 4.90 1512 0.45 2106 4.67
25	4.82	0318 0.62 0918 5.08 1548 0.26 2148 4.42
26	4.99	0348 0.88 0948 5.18 1636 0.19 2230 4.08
27	4.96	0418 1.22 1024 5.19 1724 0.23 2324 3.68
28	4.74	0454 1.60 1106 5.08 1818 0.34
29	4.43	0036 3.31 0536 2.00 1154 4.88 1936 0.45
30	4.20	0212 3.12 0642 2.36 1312 4.65 2100 0.45

TABLE 25. San Nicolas Island Tides, October 1995

October 1995		
San Nicolas Island, CA		
33° 16.0' North, 119° 30.0' West		
Tidal range, highs, and lows in feet		
Pacific Standard Time - Add one hour for Daylight Savings Time		
Date	Range	Time
01	4.20	0354 3.25 0830 2.53 1442 4.51 2218 0.31
02	4.41	0506 3.59 1018 2.32 1606 4.56 2330 0.15
03	2.84	0554 3.98 1136 1.86 1718 4.70
04	4.79	0018 0.04 0636 4.36 1230 1.34 1818 4.84
05	4.84	0054 0.04 0712 4.70 1318 0.85 1906 4.88
06	4.83	0136 0.14 0742 4.97 1354 0.46 1954 4.81
07	4.96	0212 0.34 0812 5.15 1442 0.19 2036 4.65
08	5.19	0242 0.60 0842 5.24 1512 0.06 2118 4.40
09	5.18	0306 0.92 0912 5.23 1554 0.05 2154 4.10
10	4.98	0336 1.26 0936 5.13 1630 0.15 2236 3.76
11	4.60	0400 1.62 1006 4.94 1712 0.34 2324 3.43
12	4.11	0430 1.97 1042 4.69 1806 0.58
13	3.58	0024 3.13 0506 2.30 1118 4.39 1854 0.82
14	3.09	0148 2.95 0548 2.61 1154 4.07 2012 0.99
15	2.76	0348 3.01 0712 2.86 1312 3.78 2130 1.02
16	2.69	0454 3.25 0936 2.83 1448 3.64 2236 0.95
17	2.84	0536 3.51 1054 2.51 1612 3.69 2324 0.85
18	3.08	0554 3.80 1148 2.08 1718 3.84 2400 0.76
19	2.51	0624 4.11 1224 1.60 1806 4.01
20	3.73	0030 0.71 0648 4.44 1300 1.09 1848 4.16
21	4.19	0100 0.70 0712 4.78 1336 0.59 1930 4.26
22	4.98	0130 0.74 0742 5.12 1418 0.14 2012 4.29
23	5.65	0206 0.85 0812 5.41 1454 -0.24 2054 4.22
24	6.10	0242 1.01 0842 5.62 1542 -0.48 2142 4.07
25	6.28	0318 1.24 0918 5.70 1630 -0.57 2236 3.85
26	6.15	0354 1.53 0954 5.63 1718 -0.52 2336 3.61
27	5.75	0442 1.85 1048 5.41 1818 -0.34
28	5.17	0048 3.43 0536 2.18 1142 5.05 1918 -0.12
29	4.56	0206 3.41 0648 2.43 1248 4.63 2030 0.07
30	4.07	0330 3.61 0836 2.44 1418 4.28 2142 0.21
31	3.80	0436 3.95 1012 2.09 1548 4.10 2242 0.30

TABLE 26. San Nicolas Island Tides, November 1995

November 1995

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht
01	3.90	0524	4.32	1136	1.56	1706	4.07
02	3.67	0606	4.67	1230	1.00	1812	4.09
03	4.46	0024	0.57	0636	4.97	1318	0.51
04	5.05	0106	0.76	0712	5.19	1354	0.14
05	5.44	0136	0.98	0742	5.33	1436	-0.11
06	5.62	0206	1.21	0812	5.38	1512	-0.25
07	5.62	0236	1.44	0836	5.35	1542	-0.27
08	5.45	0300	1.68	0906	5.25	1618	-0.20
09	5.14	0330	1.91	0936	5.08	1654	-0.06
10	4.71	0400	2.14	1006	4.85	1736	0.13
11	4.19	0012	3.17	0436	2.37	1042	4.56
12	3.63	0112	3.09	0524	2.60	1118	4.21
13	3.07	0230	3.13	0630	2.79	1212	3.85
14	2.60	0342	3.30	0824	2.80	1324	3.50
15	2.58	0430	3.56	1012	2.51	1454	3.29
16	2.85	0454	3.87	1118	2.03	1624	3.27
17	3.17	0530	4.23	1200	1.45	1736	3.37
18	3.80	0554	4.63	1242	0.83	1830	3.53
19	4.84	0012	1.10	0630	5.05	1324	0.22
20	5.79	0048	1.15	0706	5.45	1400	-0.34
21	6.58	0130	1.21	0742	5.79	1448	-0.79
22	7.09	0212	1.31	0818	6.02	1536	-1.07
23	7.26	0254	1.44	0854	6.08	1618	-1.18
24	7.06	0342	1.61	0942	5.96	1712	-1.09
25	6.50	0436	1.81	1036	5.64	1754	-0.86
26	5.67	0030	3.69	0536	2.03	1130	5.16
27	4.70	0136	3.75	0654	2.18	1230	4.58
28	3.75	0248	3.92	0818	2.14	1348	4.01
29	3.58	0348	4.18	1000	1.82	1524	3.60
30	3.60	0442	4.48	1118	1.31	1648	3.41

TABLE 27. San Nicolas Island Tides, December 1995

December 1995

San Nicolas Island, CA

33° 16.0' North, 119° 30.0' West

Tidal range, highs, and lows in feet

Pacific Standard Time - Add one hour for Daylight Savings Time

Date	Range	Time	Ht	Time	Ht	Time	Ht
01	4.00	0530	4.77	1224	0.77	1806	3.38
02	4.70	0612	5.01	1312	0.31	1906	3.41
03	5.23	0030	1.33	0642	5.19	1354	-0.04
04	5.57	0112	1.50	0718	5.30	1430	-0.28
05	5.76	0142	1.65	0748	5.35	1506	-0.41
06	5.81	0212	1.76	0818	5.35	1536	-0.47
07	5.74	0248	1.86	0848	5.29	1600	-0.45
08	5.53	0312	1.97	0918	5.17	1636	-0.36
09	5.18	0342	2.09	0948	4.98	1712	-0.21
10	4.71	0418	2.22	1018	4.71	1742	-0.01
11	4.13	0030	3.29	0500	2.37	1054	4.37
12	3.45	0118	3.32	0606	2.49	1130	3.96
13	2.73	0206	3.43	0724	2.53	1224	3.52
14	2.57	0254	3.62	0906	2.37	1342	3.09
15	2.65	0348	3.90	1036	1.92	1530	2.83
16	2.96	0430	4.27	1142	1.30	1706	2.83
17	4.08	0512	4.70	1224	0.62	1818	3.00
18	5.21	0554	5.16	1312	-0.06	1912	3.24
19	6.26	0012	1.49	0636	5.60	1354	-0.66
20	7.11	0106	1.46	0718	5.97	1436	-1.13
21	7.64	0154	1.42	0806	6.21	1524	-1.42
22	7.77	0248	1.39	0848	6.27	1606	-1.51
23	7.48	0336	1.40	0936	6.10	1654	-1.38
24	6.78	0430	1.47	1024	5.72	1742	-1.06
25	5.74	0524	1.59	1118	5.14	1824	-0.60
26	4.50	0054	4.07	0636	1.71	1212	4.44
27	3.66	0154	4.14	0754	1.74	1324	3.72
28	3.28	0254	4.26	0930	1.56	1454	3.15
29	3.26	0354	4.43	1100	1.17	1636	2.88
30	3.92	0454	4.62	1206	0.69	1806	2.89
31	4.54	0542	4.80	1306	0.26	1912	3.02

TABLE 28. Moonrise and Moonset, Barking Sands, 1995

Location: W159 47', N22 02'		Jan.		Feb.		Mar.		Apr.		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.	
		Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
01		0728	1855	0826	2036	0700	1917	0733	2039	0737	2105	0845	2206	0916	2207	1045	2246	1235	2358	1324	1432	0144	1433	0226	1433
02		0821	1958	0906	2131	0740	2012	0814	2131	0823	2153	0936	2247	1008	2245	1142	2329	1335	2451	1416	0051	1513	0240	1513	0319
03		0909	2058	0945	2224	0819	2105	0857	2221	0911	2240	1027	2327	1100	2324	1240	2451	1433	0056	1504	0151	1553	0335	1553	0412
04		0953	2156	1024	2316	0858	2157	0941	2311	1000	2325	1119	2441	1154	2324	1341	0016	1528	0156	1550	0251	1633	0430	1636	0504
05		1034	2250	1102	2408	0938	2248	1028	2358	1050	2408	1212	0006	1250	0004	1442	0108	1620	0258	1633	0349	1713	0523	1720	0555
06		1112	2343	1142	0007	1019	2339	1116	0007	1141	0007	1306	0045	1349	0046	1543	0204	1709	0359	1714	0446	1755	0617	1806	0646
07		1149	0058	1224	0058	1102	0058	1206	0045	1233	0048	1402	0125	1449	0132	1642	0304	1754	0500	1755	0542	1839	0709	1854	0735
08		1227	0035	1308	0148	1147	0029	1258	0129	1327	0129	1501	0206	1552	0222	1738	0408	1838	0600	1836	0637	1924	0801	1943	0822
09		1305	0125	1354	0238	1235	0118	1350	0212	1421	0208	1602	0252	1656	0317	1830	0512	1919	0658	1917	0732	2011	0851	2032	0907
10		1346	0216	1443	0326	1324	0205	1444	0253	1518	0249	1707	0341	1759	0418	1918	0615	2000	0754	2000	0825	2059	0939	2122	0949
11		1428	0306	1534	0414	1416	0251	1540	0334	1617	0331	1812	0436	1858	0522	2003	0716	2041	0849	2044	0918	2148	1025	2212	1029
12		1513	0356	1627	0500	1509	0336	1637	0415	1719	0415	1917	0535	1953	0627	2045	0816	2123	0943	2130	1009	2238	1109	2302	1108
13		1601	0445	1721	0544	1603	0419	1736	0457	1824	0504	2018	0639	2043	0732	2126	0913	2206	1036	2217	1058	2328	1151	2353	1146
14		1651	0534	1816	0626	1659	0501	1837	0541	1929	0557	2115	0744	2129	0834	2207	1008	2251	1127	2306	1145	2351	1231	2353	1224
15		1743	0621	1912	0708	1755	0542	1940	0628	2034	0655	2206	0848	2211	0934	2247	1102	2337	1217	2355	1231	0019	1310	0046	1302
16		1836	0706	2008	0749	1854	0624	2045	0719	2137	0756	2253	0951	2252	1031	2329	1154	2406	1306	2406	1355	0110	1348	0140	1343
17		1930	0749	2106	0830	1953	0707	2149	0813	2234	0900	2335	1050	2331	1126	2406	1246	0025	1352	0046	1355	0203	1427	0236	1427
18		2025	0830	2204	0912	2055	0751	2251	0911	2326	1003	2406	1147	2406	1241	2406	1336	0114	1437	0137	1435	0257	1508	0335	1515
19		2120	0910	2304	0956	2157	0839	2349	1012	2406	1104	2406	1241	2406	1311	2406	1425	0204	1520	0229	1515	0354	1552	0438	1608
20		2215	0950	2403	1043	2259	0929	2406	1113	2406	1203	2406	1334	2406	1402	2406	1513	0256	1601	0322	1555	0454	1639	0542	1706
21		2312	1030	0005	1133	2359	1023	0043	1214	0057	1259	0133	1426	0132	1453	0232	1559	0348	1641	0417	1635	0557	1731	0646	1809
22		0011	1112	0106	1227	0001	1121	0131	1312	0137	1354	0211	1517	0215	1542	0322	1643	0441	1721	0514	1718	0701	1828	0748	1915
23		0010	1156	0206	1325	0059	1220	0216	1409	0216	1446	0252	1607	0301	1631	0413	1725	0536	1802	0613	1804	0805	1928	0845	2020
24		0110	1244	0304	1425	0154	1319	0257	1504	0254	1538	0334	1657	0348	1718	0505	1806	0631	1843	0714	1853	0907	2032	0938	2124
25		0211	1336	0358	1525	0245	1419	0336	1557	0332	1629	0418	1747	0438	1803	0558	1846	0729	1926	0817	1946	1005	2135	1027	2226
26		0313	1433	0449	1626	0332	1517	0415	1650	0411	1720	0504	1835	0528	1846	0651	1925	0828	2012	0920	2044	1058	2238	1111	2324
27		0414	1533	0536	1725	0416	1613	0453	1741	0452	1811	0552	1921	0620	1928	0745	2005	0928	2102	1021	2143	1147	2338	1153	2434
28		0513	1635	0619	1822	0457	1708	0531	1833	0535	1901	0642	2005	0712	2008	0841	2046	1029	2155	1119	2245	1232	2434	1234	0020
29		0607	1738			0536	1802	0612	1924	0620	1950	0733	2047	0804	2047	0947	2129	1129	2251	1213	2346	1313	0036	1313	0115
30		0657	1839			0615	1855	0653	2015	0707	2037	0824	2128	0857	2126	1035	2215	1228	2350	1303	2434	1354	0132	1354	0208
31		0744	1939			0654	1948			0756	2123			0951	2205	1135	2305			1349	0046			1435	0300

Astronomical Applications Dept.  
U.S. Naval Observatory  
Washington, D.C. 20392-5420

Barking Sands, Kauai, Hawaii  
Rise and Set for the Moon for 1995  
Hawaii-Aleutian Time

TABLE 29. Port Allen Tides, January 1995

January 1995

Port Allen, Hanapepe Bay, HI

21° 54.0' North, 159° 35.0' West

Tidal range, highs, and lows in feet

Alaska-Hawaii Standard Time (AHST)

Date	Range	Time	Ht	Time	Ht	Time	Ht
01	2.48	0342	2.29	1054	0.03	1542	0.71
02	2.30	0418	2.22	1142	0.02	1630	0.75
03	2.06	0454	2.08	1218	0.02	1724	0.79
04	1.86	0536	1.90	1254	0.04	1818	0.84
05	1.62	0612	1.68	1330	0.05	1924	0.91
06	1.37	0030	0.46	0648	1.44	1406	0.07
07	1.14	0148	0.64	0724	1.21	1448	0.08
08	1.23	0336	0.75	0806	1.00	1530	0.08
09	1.40	0548	0.73	0906	0.82	1618	0.07
10	0.64	0724	0.61	1024	0.69	1706	0.05
11	1.58	0048	1.60	0812	0.50	1142	0.67
12	1.75	0124	1.73	0848	0.39	1242	0.65
13	1.88	0154	1.83	0924	0.30	1330	0.65
14	1.97	0230	1.91	0954	0.23	1412	0.67
15	2.02	0254	1.95	1018	0.18	1454	0.70
16	2.01	0336	1.96	1048	0.14	1530	0.74
17	1.93	0354	1.94	1118	0.11	1606	0.78
18	1.80	0430	1.88	1142	0.08	1654	0.84
19	1.72	0506	1.77	1212	0.05	1742	0.91
20	1.60	0536	1.63	1242	0.02	1836	0.99
21	1.44	0612	1.44	1324	0.00	1942	1.09
22	1.25	0112	0.54	0654	1.24	1406	-0.02
23	1.44	0254	0.66	0742	1.02	1454	-0.03
24	1.67	0506	0.64	0854	0.83	1554	-0.06
25	0.78	0648	0.50	1024	0.69	1654	-0.09
26	1.94	0024	1.81	0754	0.34	1154	0.65
27	2.15	0118	1.97	0836	0.20	1254	0.66
28	2.28	0154	2.08	0918	0.10	1354	0.72
29	2.30	0242	2.12	0954	0.03	1448	0.79
30	2.22	0324	2.09	1030	0.00	1530	0.86
31	2.03	0354	1.99	1054	-0.01	1612	0.93

TABLE 30. Port Allen Tides, February 1995

February 1995

Port Allen, Hanapepe Bay, HI

21° 54.0' North, 159° 35.0' West

Tidal range, highs, and lows in feet

Alaska-Hawaii Standard Time (AHST)

Date	Range	Time	Ht	Time	Ht	Time	Ht
01	1.85	0436	1.85	1136	0.00	1654	0.99
02	1.65	0506	1.67	1206	0.01	1748	1.04
03	1.43	0536	1.47	1236	0.04	1836	1.08
04	1.20	0018	0.42	0606	1.26	1306	0.06
05	1.09	0124	0.57	0642	1.07	1342	0.09
06	1.15	0254	0.68	0718	0.89	1430	0.12
07	1.25	0512	0.67	0812	0.73	1524	0.13
08	0.60	0654	0.56	0954	0.63	1624	0.13
09	1.42	0006	1.51	0742	0.44	1124	0.60
10	1.58	0048	1.63	0818	0.34	1230	0.63
11	1.72	0130	1.73	0848	0.25	1318	0.69
12	1.83	0154	1.80	0912	0.18	1354	0.76
13	1.88	0236	1.83	0936	0.12	1436	0.85
14	1.87	0306	1.83	0954	0.07	1512	0.94
15	1.77	0336	1.78	1030	0.03	1554	1.03
16	1.70	0406	1.69	1054	-0.01	1630	1.13
17	1.60	0436	1.56	1124	-0.04	1718	1.21
18	1.45	0512	1.40	1154	-0.05	1812	1.29
19	1.40	0012	0.35	0548	1.21	1230	-0.05
20	1.45	0130	0.48	0630	1.01	1312	-0.03
21	1.51	0312	0.55	0724	0.81	1406	0.00
22	1.60	0512	0.50	0848	0.66	1518	0.03
23	1.72	0636	0.37	1036	0.60	1630	0.03
24	0.65	0730	0.24	1154	0.65	1742	0.00
25	1.88	0054	1.84	0812	0.13	1306	0.75
26	1.94	0142	1.88	0848	0.06	1354	0.86
27	1.92	0218	1.86	0918	0.01	1436	0.98
28	1.81	0254	1.79	0948	-0.02	1518	1.09

TABLE 31. Port Allen Tides, March 1995

March 1995									
Port Allen, Hanapepe Bay, HI									
21° 54.0' North, 159° 35.0' West									
Tidal range, highs, and lows in feet									
Alaska-Hawaii Standard Time (AHST)									
Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	1.70	0330	1.68	1018	-0.02	1554	1.18	2154	0.05
02	1.54	0406	1.53	1042	-0.01	1636	1.25	2242	0.15
03	1.36	0436	1.37	1106	0.00	1712	1.29	2324	0.26
04	1.28	0506	1.20	1136	0.03	1754	1.31		
05	1.24	0518	0.38	0530	1.04	1154	0.07	1848	1.31
06	1.20	0118	0.49	0606	0.89	1236	0.12	1942	1.31
07	1.15	0242	0.56	0642	0.75	1318	0.17	2054	1.32
08	1.15	0430	0.55	0748	0.64	1412	0.22	2206	1.37
09	1.20	0554	0.47	0936	0.58	1530	0.24	2306	1.44
10	1.29	0654	0.37	1112	0.61	1642	0.23	2354	1.52
11	0.51	0724	0.28	1212	0.69	1748	0.18		
12	1.46	0042	1.58	0754	0.20	1254	0.81	1842	0.12
13	1.56	0124	1.62	0818	0.12	1342	0.94	1930	0.06
14	1.60	0154	1.63	0848	0.06	1418	1.08	2012	0.03
15	1.60	0230	1.59	0912	-0.01	1454	1.23	2054	0.02
16	1.58	0306	1.52	0936	-0.06	1536	1.36	2148	0.05
17	1.58	0336	1.41	1006	-0.10	1618	1.48	2236	0.10
18	1.68	0412	1.27	1036	-0.12	1654	1.56	2330	0.19
19	1.72	0448	1.11	1112	-0.11	1748	1.61		
20	1.70	0030	0.28	0530	0.94	1148	-0.08	1848	1.62
21	1.62	0148	0.35	0624	0.77	1236	-0.01	1954	1.61
22	1.53	0324	0.37	0736	0.64	1330	0.07	2106	1.60
23	1.46	0454	0.32	0912	0.58	1448	0.15	2224	1.62
24	1.45	0606	0.22	1054	0.63	1618	0.19	2330	1.63
25	0.63	0654	0.13	1206	0.76	1736	0.17		
26	1.57	0024	1.63	0730	0.06	1254	0.92	1842	0.14
27	1.59	0112	1.60	0806	0.01	1348	1.08	1942	0.11
28	1.55	0154	1.53	0836	-0.02	1424	1.23	2030	0.10
29	1.47	0230	1.43	0854	-0.04	1454	1.35	2118	0.12
30	1.48	0254	1.31	0924	-0.04	1536	1.44	2154	0.15
31	1.54	0330	1.18	0948	-0.03	1612	1.50	2242	0.20

TABLE 32. Port Allen Tides, April 1995

April 1995									
Port Allen, Hanapepe Bay, HI									
21° 54.0' North, 159° 35.0' West									
Tidal range, highs, and lows in feet									
Alaska-Hawaii Standard Time (AHST)									
Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	1.55	0406	1.05	1012	-0.01	1648	1.53	2330	0.26
02	1.52	0436	0.93	1042	0.02	1724	1.53		
03	1.45	0018	0.32	0506	0.82	1106	0.06	1806	1.51
04	1.35	0112	0.37	0542	0.71	1142	0.12	1854	1.47
05	1.24	0224	0.40	0630	0.62	1218	0.20	1948	1.44
06	1.14	0342	0.39	0748	0.56	1312	0.27	2054	1.41
07	1.07	0454	0.34	0930	0.56	1430	0.34	2154	1.41
08	1.15	0548	0.27	1054	0.65	1554	0.36	2254	1.41
09	1.23	0624	0.19	1154	0.79	1718	0.33	2348	1.42
10	0.85	0654	0.11	1236	0.96	1818	0.27		
11	1.37	0030	1.41	0724	0.03	1318	1.15	1918	0.20
12	1.41	0112	1.37	0748	-0.04	1354	1.35	2012	0.14
13	1.65	0154	1.30	0818	-0.11	1436	1.54	2054	0.10
14	1.86	0230	1.20	0848	-0.17	1518	1.70	2154	0.08
15	2.01	0312	1.09	0924	-0.20	1554	1.81	2248	0.09
16	2.08	0354	0.96	0954	-0.20	1642	1.88	2342	0.12
17	2.05	0436	0.83	1036	-0.17	1736	1.88		
18	1.93	0048	0.16	0530	0.71	1118	-0.09	1830	1.84
19	1.74	0154	0.19	0630	0.61	1206	0.02	1924	1.76
20	1.51	0312	0.18	0754	0.57	1306	0.15	2030	1.67
21	1.43	0424	0.14	0930	0.61	1430	0.28	2136	1.57
22	1.39	0518	0.09	1054	0.75	1554	0.35	2242	1.48
23	1.35	0606	0.04	1154	0.93	1730	0.36	2342	1.39
24	1.13	0642	-0.01	1254	1.12	1842	0.33		
25	1.34	0030	1.29	0712	-0.04	1336	1.30	1942	0.29
26	1.52	0112	1.18	0742	-0.06	1412	1.45	2036	0.25
27	1.65	0154	1.07	0812	-0.08	1448	1.57	2124	0.23
28	1.74	0230	0.97	0836	-0.08	1518	1.66	2206	0.22
29	1.78	0254	0.87	0854	-0.07	1554	1.71	2248	0.22
30	1.77	0336	0.78	0930	-0.04	1624	1.73	2336	0.23

TABLE 33. Port Allen Tides, May 1995

May 1995

Port Allen, Hanapepe Bay, HI

21° 54.0' North, 159° 35.0' West

Tidal range, highs, and lows in feet

Alaska-Hawaii Standard Time (AHST)

Date	Range	Time	Ht	Time	Ht
01	1.73	0412	0.71	0954-0.01	1654 1.72
02	1.64	0018	0.25	0448 0.64	1024 0.04
03	1.52	0106	0.26	0530 0.58	1054 0.11
04	1.38	0154	0.26	0624 0.54	1136 0.20
05	1.26	0254	0.24	0736 0.54	1224 0.30
06	1.22	0348	0.20	0906 0.59	1336 0.40
07	1.20	0436	0.15	1024 0.72	1506 0.48
08	1.19	0512	0.09	1124 0.91	1642 0.48
09	1.18	0548	0.01	1212 1.13	1806 0.43
10	1.44	0624-0.07	1254 1.37	1912 0.34	2336 1.19
11	1.75	0024 1.10	0654-0.14	1336 1.60	2012 0.25
12	2.02	0112 1.01	0730-0.21	1418 1.81	2106 0.17
13	2.23	0154 0.92	0806-0.26	1454 1.97	2154 0.10
14	2.35	0248 0.82	0848-0.28	1548 2.07	2254 0.06
15	2.37	0336 0.74	0924-0.26	1630 2.11	2354 0.05
16	2.27	0430 0.66	1006-0.20	1718 2.08	
17	2.07	0048 0.05	0524 0.61	1054-0.09	1806 1.99
18	1.80	0148 0.05	0636 0.59	1148 0.06	1854 1.85
19	1.64	0242 0.04	0754 0.62	1248 0.24	1954 1.68
20	1.47	0336 0.03	0924 0.72	1406 0.40	2054 1.50
21	1.32	0430 0.01	1042 0.89	1548 0.51	2148 1.32
22	1.18	0512-0.02	1142 1.10	1724 0.54	2248 1.16
23	1.34	0548-0.05	1236 1.30	1848 0.50	2342 1.02
24	1.54	0624-0.07	1318 1.48	1954 0.43	
25	1.71	0030 0.90	0654-0.08	1354 1.62	2048 0.36
26	1.83	0118 0.81	0724-0.09	1430 1.73	2136 0.30
27	1.90	0154 0.73	0754-0.09	1454 1.81	2212 0.26
28	1.93	0236 0.68	0824-0.08	1536 1.85	2254 0.23
29	1.93	0312 0.64	0854-0.06	1606 1.87	2330 0.20
30	1.88	0354 0.60	0924-0.02	1636 1.86	
31	1.79	0012 0.19	0430 0.58	0954 0.03	1712 1.83

TABLE 34. Port Allen Tides, June 1995

June 1995

Port Allen, Hanapepe Bay, HI

21° 54.0' North, 159° 35.0' West

Tidal range, highs, and lows in feet

Alaska-Hawaii Standard Time (AHST)

Date	Range	Time	Ht	Time	Ht
01	1.66	0048	0.18	0518 0.56	1030 0.11
02	1.52	0130 0.17	0612 0.57	1106 0.20	1748 1.77
03	1.44	0212 0.15	0718 0.61	1154 0.33	1824 1.69
04	1.34	0248 0.11	0830 0.70	1254 0.46	1906 1.58
05	1.24	0330 0.07	0948 0.86	1430 0.58	1948 1.45
06	1.15	0412 0.02	1054 1.07	1618 0.62	2042 1.31
07	1.37	0448-0.05	1148 1.32	1754 0.57	2136 1.16
08	1.69	0530-0.12	1236 1.57	1912 0.46	2242 1.02
09	2.00	0612-0.19	1318 1.81	2018 0.33	2342 0.90
10	2.26	0042 0.81	0654-0.25	1406 2.01	
11	2.45	0136 0.74	0736-0.29	1448 2.16	2112 0.21
12	2.53	0236 0.70	0824-0.29	1530 2.24	2206 0.12
13	2.50	0324 0.67	0906-0.26	1618 2.24	2254 0.05
14	2.34	0418 0.66	0954-0.17	1654 2.17	2342 0.02
15	2.08	0030 0.00	0518 0.67	1042-0.04	1748 2.04
16	1.85	0118 0.00	0624 0.70	1130 0.13	1830 1.86
17	1.63	0154 0.01	0730 0.77	1230 0.33	1918 1.64
18	1.40	0248 0.01	0854 0.89	1348 0.52	2006 1.42
19	1.19	0330 0.01	1012 1.05	1524 0.65	2054 1.20
20	1.24	0412 0.01	1118 1.24	1718 0.68	2148 1.01
21	1.44	0454-0.01	1212 1.43	1848 0.62	2248 0.86
22	1.61	0536-0.02	1254 1.60	1954 0.52	2348 0.76
23	1.76	0612-0.03	1336 1.73	2048 0.43	
24	1.88	0042 0.69	0648-0.04	1412 1.83	2130 0.35
25	1.95	0130 0.66	0724-0.05	1442 1.90	2206 0.29
26	1.99	0218 0.65	0754-0.04	1512 1.95	2242 0.25
27	1.99	0254 0.65	0830-0.03	1548 1.96	2312 0.21
28	1.94	0336 0.65	0906 0.01	1618 1.95	2342 0.19
29	1.85	0418 0.66	0936 0.06	1648 1.91	
30	1.70	0012 0.17	0454 0.69	1012 0.14	1718 1.84



TABLE 35. Port Allen Tides, July 1994

July 1995									
Port Allen, Hanapepe Bay, HI									
21° 54.0' North, 159° 35.0' West									
Tidal range, highs, and lows in feet									
Alaska-Hawaii Standard Time (AHST)									
Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	1.59	0042	0.15	0548	0.73	1054	0.25	1748	1.74
02	1.48	0118	0.13	0642	0.80	1142	0.38	1824	1.60
03	1.34	0154	0.10	0748	0.91	1248	0.54	1906	1.44
04	1.19	0230	0.07	0854	1.06	1418	0.67	1948	1.26
05	1.24	0312	0.02	1012	1.27	1606	0.73	2048	1.07
06	1.53	0354	-0.02	1118	1.50	1754	0.66	2154	0.91
07	1.82	0448	-0.08	1212	1.74	1918	0.52	2312	0.80
08	2.09	0542	-0.13	1254	1.96	2018	0.37		
09	2.31	0024	0.74	0630	-0.18	1348	2.13	2112	0.24
10	2.46	0130	0.73	0718	-0.21	1436	2.24	2154	0.15
11	2.49	0224	0.75	0806	-0.21	1518	2.28	2236	0.08
12	2.42	0318	0.79	0854	-0.17	1554	2.25	2318	0.05
13	2.22	0406	0.83	0942	-0.07	1642	2.14	2354	0.04
14	1.91	0454	0.89	1030	0.06	1718	1.98		
15	1.72	0030	0.05	0554	0.95	1124	0.24	1754	1.77
16	1.48	0112	0.07	0654	1.02	1218	0.43	1836	1.55
17	1.23	0148	0.09	0806	1.11	1330	0.62	1918	1.32
18	1.12	0230	0.11	0924	1.23	1506	0.75	1954	1.11
19	1.25	0312	0.12	1036	1.37	1706	0.77	2054	0.93
20	1.39	0354	0.13	1136	1.52	1848	0.69	2206	0.80
21	1.54	0448	0.12	1224	1.66	1954	0.58	2324	0.73
22	1.67	0536	0.10	1306	1.78	2036	0.48		
23	1.79	0024	0.72	0624	0.08	1342	1.87	2106	0.40
24	1.88	0118	0.73	0654	0.06	1418	1.94	2136	0.34
25	1.93	0154	0.77	0742	0.05	1448	1.98	2206	0.29
26	1.93	0242	0.80	0818	0.06	1518	1.99	2230	0.25
27	1.88	0318	0.85	0854	0.09	1548	1.96	2254	0.23
28	1.77	0354	0.91	0930	0.14	1618	1.91	2324	0.20
29	1.64	0436	0.97	1012	0.22	1648	1.81	2354	0.18
30	1.36	0518	1.04	1054	0.33	1718	1.69		
31	1.37	0018	0.16	0612	1.12	1142	0.47	1748	1.53

TABLE 36. Port Allen Tides, August 1994

August 1995									
Port Allen, Hanapepe Bay, HI									
21° 54.0' North, 159° 35.0' West									
Tidal range, highs, and lows in feet									
Alaska-Hawaii Standard Time (AHST)									
Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	1.21	0054	0.14	0712	1.22	1248	0.61	1830	1.35
02	1.22	0130	0.12	0818	1.34	1418	0.73	1912	1.16
03	1.38	0218	0.11	0936	1.49	1612	0.76	2012	0.97
04	1.58	0312	0.09	1048	1.67	1806	0.66	2142	0.84
05	1.80	0418	0.06	1148	1.86	1918	0.51	2312	0.78
06	2.00	0518	0.02	1242	2.03	2006	0.38		
07	2.17	0024	0.80	0618	-0.02	1330	2.15	2048	0.27
08	2.25	0124	0.87	0712	-0.05	1418	2.21	2124	0.19
09	2.24	0218	0.96	0806	-0.05	1454	2.20	2154	0.14
10	2.12	0306	1.05	0854	-0.01	1536	2.12	2236	0.12
11	1.90	0354	1.14	0942	0.08	1612	1.98	2306	0.12
12	1.66	0442	1.21	1030	0.21	1648	1.80	2342	0.14
13	1.24	0530	1.28	1118	0.36	1724	1.60		
14	1.22	0012	0.17	0618	1.32	1212	0.52	1754	1.39
15	1.16	0048	0.20	0718	1.36	1318	0.67	1830	1.20
16	1.17	0124	0.24	0824	1.41	1448	0.77	1912	1.02
17	1.20	0206	0.28	0936	1.48	1648	0.78	2012	0.88
18	1.26	0254	0.31	1042	1.57	1824	0.70	2142	0.79
19	1.35	0354	0.31	1142	1.67	1918	0.60	2312	0.78
20	1.47	0506	0.30	1230	1.77	1954	0.51		
21	1.58	0018	0.83	0554	0.26	1312	1.85	2024	0.43
22	1.68	0106	0.89	0648	0.22	1342	1.90	2054	0.37
23	1.73	0148	0.97	0730	0.19	1418	1.92	2118	0.32
24	1.73	0224	1.06	0806	0.18	1448	1.91	2142	0.28
25	1.67	0254	1.15	0848	0.20	1518	1.86	2206	0.24
26	1.57	0336	1.25	0930	0.24	1548	1.78	2230	0.21
27	1.48	0412	1.34	1012	0.31	1618	1.66	2254	0.18
28	1.35	0454	1.43	1054	0.40	1648	1.52	2324	0.17
29	1.34	0542	1.51	1154	0.52	1724	1.35	2354	0.17
30	0.99	0636	1.57	1254	0.63	1806	1.18		
31	1.44	0042	0.18	0742	1.63	1436	0.71	1854	1.01



TABLE 39. Port Allen Tides, November 1995

November 1995									
Port Allen, Hanapepe Bay, HI									
21° 54.0' North, 159° 35.0' West									
Tidal range, highs, and lows in feet									
Alaska-Hawaii Standard Time (AHST)									
Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	1.44	0454	0.59	1106	1.57	1812	0.14		
02	1.36	0330	1.33	0618	0.55	1154	1.46	1848	0.10
03	1.46	0112	1.53	0724	0.50	1248	1.34	1918	0.07
04	1.64	0154	1.70	0824	0.44	1330	1.22	1948	0.05
05	1.78	0230	1.83	0912	0.40	1406	1.11	2018	0.05
06	1.85	0306	1.92	0954	0.38	1442	1.01	2042	0.06
07	1.88	0336	1.97	1042	0.38	1518	0.92	2106	0.09
08	1.85	0412	1.98	1124	0.38	1554	0.84	2136	0.13
09	1.77	0448	1.96	1206	0.39	1630	0.78	2206	0.19
10	1.65	0524	1.91	1254	0.40	1712	0.73	2236	0.26
11	1.48	0554	1.84	1348	0.40	1812	0.69	2312	0.36
12	1.38	0642	1.76	1442	0.39	1924	0.69	2354	0.47
13	1.32	0730	1.67	1530	0.35	2054	0.75		
14	1.27	0106	0.59	0824	1.57	1618	0.30	2218	0.88
15	1.23	0242	0.69	0918	1.47	1654	0.24	2318	1.06
16	1.21	0424	0.71	1018	1.38	1730	0.17	2354	1.28
17	1.19	0548	0.66	1112	1.28	1754	0.09		
18	1.49	0042	1.51	0654	0.57	1154	1.19	1836	0.01
19	1.79	0124	1.73	0754	0.46	1248	1.10	1906	-0.06
20	2.06	0154	1.94	0854	0.36	1336	1.02	1942	-0.12
21	2.27	0242	2.11	0942	0.28	1424	0.93	2018	-0.16
22	2.38	0324	2.23	1036	0.22	1512	0.86	2054	-0.16
23	2.39	0406	2.28	1124	0.19	1554	0.80	2142	-0.11
24	2.28	0454	2.26	1218	0.18	1654	0.75	2224	-0.02
25	2.05	0536	2.18	1312	0.17	1754	0.72	2312	0.13
26	1.89	0630	2.04	1406	0.16	1912	0.74		
27	1.73	0012	0.30	0718	1.87	1506	0.14	2042	0.82
28	1.56	0124	0.49	0818	1.67	1554	0.11	2206	0.99
29	1.39	0306	0.64	0918	1.47	1642	0.08	2318	1.20
30	1.24	0454	0.69	1018	1.28	1724	0.05		

TABLE 40. Port Allen Tides, December 1995

December 1995									
Port Allen, Hanapepe Bay, HI									
21° 54.0' North, 159° 35.0' West									
Tidal range, highs, and lows in feet									
Alaska-Hawaii Standard Time (AHST)									
Date	Range	Time	Ht	Time	Ht	Time	Ht	Time	Ht
01	1.40	0012	1.42	0624	0.64	1118	1.12	1754	0.02
02	1.62	0054	1.61	0736	0.55	1212	0.99	1836	-0.01
03	1.79	0142	1.77	0836	0.46	1254	0.89	1906	-0.02
04	1.92	0218	1.89	0924	0.39	1342	0.82	1942	-0.02
05	1.98	0248	1.97	1006	0.34	1424	0.76	2012	-0.02
06	2.00	0324	2.00	1042	0.30	1454	0.73	2042	0.00
07	1.97	0354	2.01	1118	0.28	1536	0.70	2112	0.04
08	1.89	0424	1.99	1154	0.26	1618	0.68	2142	0.09
09	1.77	0454	1.94	1230	0.25	1654	0.67	2212	0.17
10	1.63	0530	1.87	1306	0.24	1748	0.67	2248	0.27
11	1.55	0606	1.78	1348	0.23	1848	0.69	2336	0.40
12	1.45	0642	1.66	1424	0.20	2006	0.77		
13	1.35	0030	0.54	0724	1.51	1506	0.17	2124	0.90
14	1.23	0154	0.68	0806	1.35	1542	0.12	2236	1.09
15	1.27	0348	0.75	0906	1.19	1624	0.06	2330	1.33
16	1.06	0536	0.70	1006	1.04	1706	-0.01		
17	1.67	0018	1.57	0654	0.58	1112	0.92	1748	-0.09
18	1.98	0054	1.81	0806	0.44	1218	0.83	1830	-0.17
19	2.25	0148	2.02	0854	0.30	1312	0.78	1918	-0.23
20	2.45	0230	2.19	0942	0.19	1406	0.75	1954	-0.26
21	2.54	0312	2.29	1030	0.11	1454	0.74	2042	-0.25
22	2.51	0354	2.31	1112	0.06	1554	0.74	2130	-0.19
23	2.34	0436	2.26	1154	0.03	1648	0.75	2218	-0.08
24	2.12	0518	2.14	1242	0.02	1748	0.78	2306	0.08
25	1.93	0554	1.96	1324	0.02	1854	0.83		
26	1.70	0006	0.28	0648	1.73	1412	0.03	2006	0.92
27	1.45	0112	0.49	0730	1.48	1454	0.03	2130	1.07
28	1.22	0248	0.66	0824	1.24	1542	0.03	2248	1.25
29	1.42	0448	0.71	0918	1.02	1630	0.02	2348	1.44
30	0.85	0636	0.65	1030	0.85	1712	0.00		
31	1.63	0042	1.61	0748	0.53	1136	0.74	1754	-0.01

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## Appendix A

## Appendix A

### HEIGHT OF THE TIDE AT ANY TIME

The height of the tide at times intermediate to the times of high and low water is needed on occasion, and may be computed by numerical methods. An example of the method, (adapted from Table 3 of the data source), is presented here, using the predicted tides for a day at Point Mugu.

**Problem:** Given that the predicted times and heights of the tides are:

<u>TIME</u>	<u>HEIGHT</u>
0039	4.9
0814	0.2
1510	3.1
1933	2.4

What is the height of the tide at 0300?

Numerical Method

The duration of fall is 08h 14m - 00h 39m = 7h 35m

The time after high water is 03h 00m - 00h 39m = 2h 21m

The range of tide is 4.9 - 0.2 = 4.7 feet

Entering Table A-1 at the duration of fall of 7h 40m, which is the nearest value to 6h 35m, the nearest value on the horizontal line to 2h 21m is 2h 18m after high water. Following down this column to its intersection with a range of 4.5 feet which is the nearest value to 4.7 feet, one obtains 0.9 which, being calculated from high water, must be subtracted from 4.9. The approximate height at 0300 is therefore 4.0 feet.

When the duration of rise or fall is greater than 10h 40m, enter the table with one-half the given duration and with one-half the time from nearest high or low water; but if the duration of rise or fall is less than 4h 00m, enter the table with double the given duration and time.

TABLE A-1. Height of the Tide at Any Time

h.m.	Time from the nearest high water or low water														
	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.
4 00	0 08	0 16	0 24	0 32	0 40	0 48	0 56	1 04	1 12	1 20	1 28	1 36	1 44	1 52	2 00
4 20	0 09	0 17	0 26	0 35	0 43	0 52	1 01	1 09	1 18	1 27	1 35	1 44	1 53	2 01	2 10
4 40	0 09	0 19	0 28	0 37	0 47	0 56	1 05	1 15	1 24	1 33	1 43	1 52	2 01	2 11	2 20
5 00	0 10	0 20	0 30	0 40	0 50	1 00	1 10	1 20	1 30	1 40	1 50	2 00	2 10	2 20	2 30
5 20	0 11	0 21	0 32	0 43	0 53	1 04	1 15	1 25	1 36	1 47	1 57	2 08	2 19	2 29	2 40
5 40	0 11	0 23	0 34	0 45	0 57	1 08	1 19	1 31	1 42	1 53	2 05	2 16	2 27	2 39	2 50
6 00	0 12	0 24	0 36	0 48	1 00	1 12	1 24	1 36	1 48	2 00	2 12	2 24	2 36	2 48	3 00
6 20	0 13	0 25	0 38	0 51	1 03	1 16	1 29	1 41	1 54	2 07	2 19	2 32	2 45	2 57	3 10
6 40	0 13	0 27	0 40	0 53	1 07	1 20	1 33	1 47	2 00	2 13	2 27	2 40	2 53	3 07	3 20
7 00	0 14	0 28	0 42	0 56	1 10	1 24	1 38	1 52	2 06	2 20	2 34	2 48	3 02	3 16	3 30
7 20	0 15	0 29	0 44	0 59	1 13	1 28	1 43	1 57	2 12	2 27	2 41	2 56	3 11	3 25	3 40
7 40	0 15	0 31	0 46	1 01	1 17	1 32	1 47	2 03	2 18	2 33	2 49	3 04	3 19	3 35	3 50
8 00	0 16	0 32	0 48	1 04	1 20	1 36	1 52	2 08	2 24	2 40	2 56	3 12	3 28	3 44	4 00
8 20	0 17	0 33	0 50	1 07	1 23	1 40	1 57	2 13	2 30	2 47	3 03	3 20	3 37	3 53	4 10
8 40	0 17	0 35	0 52	1 09	1 27	1 44	2 01	2 19	2 36	2 53	3 11	3 28	3 45	4 03	4 20
9 00	0 18	0 36	0 54	1 12	1 30	1 48	2 06	2 24	2 42	3 00	3 18	3 36	3 54	4 12	4 30
9 20	0 19	0 37	0 56	1 15	1 33	1 52	2 11	2 29	2 48	3 07	3 25	3 44	4 03	4 21	4 40
9 40	0 19	0 39	0 58	1 17	1 37	1 56	2 15	2 35	2 54	3 13	3 33	3 52	4 11	4 31	4 50
10 00	0 20	0 40	1 00	1 20	1 40	2 00	2 20	2 40	3 00	3 20	3 40	4 00	4 20	4 40	5 00
10 20	0 21	0 41	1 02	1 23	1 43	2 04	2 25	2 45	3 06	3 27	3 47	4 08	4 29	4 49	5 10
10 40	0 21	0 43	1 04	1 25	1 47	2 08	2 29	2 51	3 12	3 33	3 55	4 16	4 37	4 59	5 20
Ft.	Correction to Height														
	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.
0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
1.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.5
1.5	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.8
2.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	1.0
2.5	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.2
3.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.8	0.9	1.0	1.2	1.3	1.5
3.5	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.6	0.7	0.9	1.0	1.2	1.4	1.6	1.8
4.0	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.7	0.8	1.0	1.2	1.4	1.6	1.8	2.0
4.5	0.0	0.0	0.1	0.2	0.3	0.4	0.6	0.7	0.9	1.1	1.3	1.6	1.8	2.0	2.2
5.0	0.0	0.1	0.1	0.2	0.3	0.5	0.6	0.8	1.0	1.2	1.5	1.7	2.0	2.2	2.5
5.5	0.0	0.1	0.1	0.2	0.4	0.5	0.7	0.9	1.1	1.4	1.6	1.9	2.2	2.5	2.8
6.0	0.0	0.1	0.1	0.3	0.4	0.6	0.8	1.0	1.2	1.5	1.8	2.1	2.4	2.7	3.0
6.5	0.0	0.1	0.2	0.3	0.4	0.6	0.8	1.1	1.3	1.6	1.9	2.2	2.6	2.9	3.2
7.0	0.0	0.1	0.2	0.3	0.5	0.7	0.9	1.2	1.4	1.8	2.1	2.4	2.8	3.1	3.5
7.5	0.0	0.1	0.2	0.3	0.5	0.7	1.0	1.2	1.5	1.9	2.2	2.6	3.0	3.4	3.8
8.0	0.0	0.1	0.2	0.3	0.5	0.8	1.0	1.3	1.6	2.0	2.4	2.8	3.2	3.6	4.0
8.5	0.0	0.1	0.2	0.4	0.6	0.8	1.1	1.4	1.8	2.1	2.5	2.9	3.4	3.8	4.2
9.0	0.0	0.1	0.2	0.4	0.6	0.9	1.2	1.5	1.9	2.2	2.7	3.1	3.6	4.0	4.5
9.5	0.0	0.1	0.2	0.4	0.6	0.9	1.2	1.6	2.0	2.4	2.8	3.3	3.8	4.3	4.8
10.0	0.0	0.1	0.2	0.4	0.7	1.0	1.3	1.7	2.1	2.5	3.0	3.5	4.0	4.5	5.0
10.5	0.0	0.1	0.3	0.5	0.7	1.0	1.3	1.7	2.2	2.6	3.1	3.6	4.2	4.7	5.2
11.0	0.0	0.1	0.3	0.5	0.7	1.1	1.4	1.8	2.3	2.8	3.3	3.8	4.4	4.9	5.5
11.5	0.0	0.1	0.3	0.5	0.8	1.1	1.5	1.9	2.4	2.9	3.4	4.0	4.6	5.1	5.8
12.0	0.0	0.1	0.3	0.5	0.8	1.1	1.5	2.0	2.5	3.0	3.6	4.1	4.8	5.4	6.0
12.5	0.0	0.1	0.3	0.5	0.8	1.2	1.6	2.1	2.6	3.1	3.7	4.3	5.0	5.6	6.2
13.0	0.0	0.1	0.3	0.6	0.9	1.2	1.7	2.2	2.7	3.2	3.9	4.5	5.1	5.8	6.5
13.5	0.0	0.1	0.3	0.6	0.9	1.3	1.7	2.2	2.8	3.4	4.0	4.7	5.3	6.0	6.8
14.0	0.0	0.2	0.3	0.6	0.9	1.3	1.8	2.3	2.9	3.5	4.2	4.8	5.5	6.3	7.0
14.5	0.0	0.2	0.4	0.6	1.0	1.4	1.9	2.4	3.0	3.6	4.3	5.0	5.7	6.5	7.2
15.0	0.0	0.2	0.4	0.6	1.0	1.4	1.9	2.5	3.1	3.8	4.4	5.2	5.9	6.7	7.5
15.5	0.0	0.2	0.4	0.7	1.0	1.5	2.0	2.6	3.2	3.9	4.6	5.4	6.1	6.9	7.8
16.0	0.0	0.2	0.4	0.7	1.1	1.5	2.1	2.6	3.3	4.0	4.7	5.5	6.3	7.2	8.0
16.5	0.0	0.2	0.4	0.7	1.1	1.6	2.1	2.7	3.4	4.1	4.9	5.7	6.5	7.4	8.2
17.0	0.0	0.2	0.4	0.7	1.1	1.6	2.2	2.8	3.5	4.2	5.0	5.9	6.7	7.6	8.5
17.5	0.0	0.2	0.4	0.8	1.2	1.7	2.2	2.9	3.6	4.4	5.2	6.0	6.9	7.8	8.8
18.0	0.0	0.2	0.4	0.8	1.2	1.7	2.3	3.0	3.7	4.5	5.3	6.2	7.1	8.1	9.0
18.5	0.1	0.2	0.5	0.8	1.2	1.8	2.4	3.1	3.8	4.6	5.5	6.4	7.3	8.3	9.2
19.0	0.1	0.2	0.5	0.8	1.3	1.8	2.4	3.1	3.9	4.8	5.6	6.6	7.5	8.5	9.5
19.5	0.1	0.2	0.5	0.8	1.3	1.9	2.5	3.2	4.0	4.9	5.8	6.7	7.7	8.7	9.8
20.0	0.1	0.2	0.5	0.9	1.3	1.9	2.6	3.3	4.1	5.0	5.9	6.9	7.9	9.0	10.0

1. Obtain from the predictions the high water and low water, one of which is before and the other after the time for which the height is required. The difference between the times of occurrence of these tides is the duration of rise or fall, and the difference between heights is the range of tide for the above table. Find the difference between the nearest high or low water and the time for which the height is required.
2. Enter the table with the duration of rise or fall, printed in heavy-faced type, which most nearly agrees with the actual value, and on that horizontal line find the time from the nearest high or low water which agrees most nearly with the corresponding actual difference. The correction sought is in the column directly below on the line with the range of tide.
3. When the nearest tide is high water, subtract the correction.
4. When the nearest tide is low water, add the correction.

## GRAPHICAL METHOD

If the height of the tide is required for a number of times on a certain day the fill tide curve for the day, may be obtained by the *one-quarter, one-tenth rule*. The procedure is as follows:

1. On cross-section paper plot the high and low water points in the order of their occurrence for the day, measuring time horizontally and height vertically. These are the basic points for the curve.
2. Draw light straight lines connecting the points representing successive high and low waters.
3. Divide each of these straight lines into four equal parts. The halfway point of each line gives another point for the curve.
4. At the quarter point adjacent to high water, draw a vertical line above the point, and at the quarter point adjacent to low water, draw a vertical line below the point, making the length of these lines equal to one-tenth of the range between the high and low waters used. The points marking the ends of these vertical lines give two additional intermediate points for the curve.
5. Draw a smooth curve through the points of high and low waters and the intermediate points, making the curve well rounded near high and low waters. This curve will approximate the actual tide curve and heights for any time of the day may be readily scaled from it. The resulting graph is shown in Figure A-1.

### CAUTION

Both methods presented are based on the assumption that the rise and fall conform to simple cosine curves. Therefore the heights obtained will be approximate. The roughness of approximation will vary as the tide curve differs from a cosine curve.

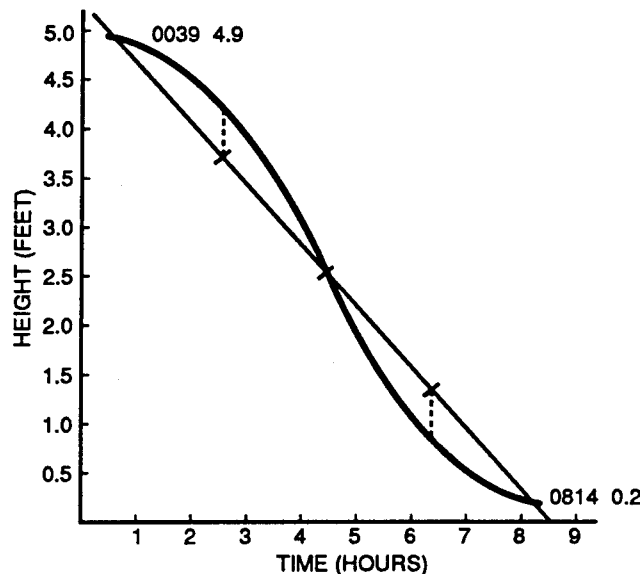


FIGURE A-1. Tidal Curve for Solution of the Problem.

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## **Appendix B**



**Appendix B**  
**EQUINOXES, SOLSTICES, AND LUNAR PHASES 1995**

The dates and times for Vernal and Autumnal Equinoxes and Summer and Winter Solstices during 1995 are listed in Table B-1. The 1995 dates and times for phases of the moon are given in Table B-2. Times are Pacific Standard Time, add 1 hour when Daylight Savings Time is in effect; add 2 hours for times in the Barking Sands area.

**TABLE B-1. Equinoxes and Solstices, 1995, Point Mugu Area**

Vernal Equinox	20 March	1814 PST	Beginning of Spring Day and night equal length
Summer Solstice	21 June	1234 PST	Beginning of Summer Greatest duration daylight
Autumnal Equinox	23 September	0413 PST	Beginning of Autumn Day and night equal length
Winter Solstice	22 December	0017 PST	Beginning of Winter Greatest duration darkness

**TABLE B-2. Lunar Phases, 1995, Point Mugu Area**

	JANUARY		FEBRUARY		MARCH		APRIL	
	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME
First Quarter	8	0746	7	0454	9	0214	7	2135
Full Moon	16	1226	15	0415	16	1726	15	0408
Last Quarter	23	2058	22	0504	23	1210	21	1918
New Moon	30	1448	--	--	30	1809	29	0936
New Moon	1	0256	--	--	1	0348	--	--
	MAY		JUNE		JULY		AUGUST	
	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME
First Quarter	7	1344	6	0226	5	1202	3	1916
Full Moon	14	1248	12	2003	12	0249	10	1015
Last Quarter	21	0336	19	1401	19	0310	17	1904
New Moon	29	0127	27	1650	27	0713	25	2031
	SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME
First Quarter	2	0103	1	0636	--	--	--	--
Full Moon	8	1937	8	0752	6	2320	6	1727
Last Quarter	16	1309	16	0826	15	0340	14	2131
New Moon	24	0855	23	2036	22	0743	21	1822
First Quarter	--	--	30	1317	28	2228	28	1106

Because the earth's period of revolution about the sun (365.24+ days) is not evenly divisible by the moon's period of revolution about the earth (27.321 days), the dates and times of lunar phases, moonrise and moonset, and tidal data must be recomputed for each year. The following information, however, is based on geometrical relationships and holds true for all times:

1. The New Moon rises at sunrise, crosses the meridian at noon, and sets at sunset.
2. The First Quarter Moon rises at noon, crosses the meridian at sunset, and sets at sunrise.
3. The Full Moon rises at sunset, crosses the meridian at midnight, and sets at sunrise.
4. The Last Quarter Moon rises at midnight, crosses the meridian at sunrise and sets at noon.

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**Appendix C**

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**TABLE C-1 Sunrise and Sunset for Point Mugu (January-June)**

Sunrise, Sunset, and Duration of Twilight for Point Mugu, CA.  
 34°07' N. 119°07' W  
 (January to June)

Note: All times are Pacific Standard Time. (120th meridian):  
 Add 1 hour when Daylight Savings Time is in effect.

Date	January		February		March		April		May		June		Date
	Sun- rise	Sun- set	Sun- rise	Sun- set	Sun- rise	Sun- set	Sun- rise	Sun- set	Sun- rise	Sun- set	Sun- rise	Sun- set	
1	0702	1658	0654	1727	0626	1753	0544	1817	0507	1840	0446	1903	1
2	0703	1659	0653	1728	0624	1753	0543	1818	0506	1841	0446	1903	2
3	0703	1700	0652	1729	0623	1754	0541	1819	0505	1842	0445	1904	3
3	0703	1700	0652	1730	0622	1755	0540	1819	0504	1843	0445	1904	3
4	0703	1700	0652	1730	0622	1755	0540	1819	0504	1843	0445	1904	4
5	0703	1701	0651	1731	0621	1756	0539	1820	0503	1843	0445	1905	5
6	0703	1702	0650	1732	0619	1757	0537	1821	0502	1844	0445	1905	6
7	0703	1703	0649	1733	0618	1758	0536	1822	0502	1845	0445	1906	7
8	0703	1704	0648	1734	0617	1758	0535	1822	0501	1846	0444	1906	8
9	0703	1705	0647	1734	0615	1759	0533	1823	0500	1846	0444	1907	9
10	0703	1705	0647	1735	0614	1800	0532	1824	0459	1847	0444	1907	10
11	0703	1706	0646	1736	0613	1801	0531	1825	0458	1848	0444	1908	11
12	0703	1707	0645	1737	0611	1802	0530	1825	0457	1849	0444	1908	12
13	0703	1708	0644	1738	0610	1802	0528	1826	0456	1849	0444	1909	13
14	0702	1709	0643	1739	0609	1803	0527	1827	0456	1850	0444	1909	14
15	0702	1710	0642	1740	0607	1804	0526	1828	0455	1851	0444	1909	15
16	0702	1711	0641	1741	0606	1805	0525	1829	0454	1852	0444	1910	16
17	0702	1712	0640	1742	0605	1806	0523	1829	0453	1852	0444	1910	17
18	0701	1713	0638	1743	0603	1806	0522	1830	0453	1853	0445	1910	18
19	0701	1714	0637	1744	0602	1807	0521	1831	0452	1854	0445	1911	19
20	0701	1715	0636	1745	0601	1808	0520	1832	0451	1855	0445	1911	20
21	0700	1716	0635	1746	0559	1809	0518	1832	0451	1844	0445	1911	21
22	0700	1717	0634	1747	0558	1809	0517	1833	0450	1856	0445	1911	22
23	0659	1718	0633	1747	0556	1810	0516	1834	0450	1857	0446	1911	23
24	0659	1719	0632	1748	0555	1811	0515	1835	0449	1857	0446	1912	24
25	0658	1720	0630	1749	0554	1812	0514	1835	0449	1858	0446	1912	25
26	0658	1721	0629	1750	0552	1813	0513	1836	0448	1859	0446	1912	26
27	0657	1722	0628	1751	0551	1813	0512	1837	0448	1900	0447	1912	27
28	0657	1723	0627	1752	0550	1814	0511	1838	0447	1900	0447	1912	28
29	0656	1724	0626	1752	0548	1815	0509	1839	0447	1901	0447	1912	29
30	0655	1725			0547	1816	0508	1839	0447	1901	0448	1912	30
31	0655	1726			0546	1816			0446	1902			31
Average Twilight Civil:		Average Twilight Civil:		Average Twilight Civil:		Average Twilight Civil:		Average Twilight Civil:		Average Twilight Civil:		Average Twilight Civil:	
27 min.		26 min.		25 min.		26 min.		28 min.		29 min.			
Nautical:		Nautical:		Nautical:		Nautical:		Nautical:		Nautical:		Nautical:	
58 min		55 min.		54 min.		57 min.		61 min.		65 min.			

Retain for use in future years. These data valid through 2020.

TABLE C-2 Sunrise and Sunset for Point Mugu (July-December)

Sunset, Sunrise, and Duration of Twilight for Point Mugu, CA.  
 34°07' N. 119°07' W  
 (July to December)

Note: All times are Pacific Standard Time (120th meridian):  
 add 1 hour when Daylight Savings Time is in effect:

Date	July		August		September		October		November		December		Date
	Sun- rise	Sun- set	Sun- rise	Sun- set	Sun- rise	Sun- set	Sun- rise	Sun- set	Sun- rise	Sun- set	Sun- rise	Sun- set	
1	0448	1912	0507	1858	0530	1823	0551	1741	0616	1704	0644	1647	1
2	0449	1912	0508	1857	0530	1821	0551	1740	0617	1703	0645	1647	2
3	0449	1912	0509	1856	0531	1820	0552	1738	0618	1702	0646	1647	3
4	0450	1912	0510	1855	0532	1819	0553	1737	0619	1701	0646	1647	4
5	0450	1912	0510	1854	0532	1817	0554	1736	0620	1700	0647	1647	5
6	0451	1911	0511	1853	0533	1816	0554	1734	0621	1659	0648	1647	6
7	0451	1911	0512	1852	0534	1815	0555	1733	0621	1658	0649	1647	7
8	0452	1911	0512	1851	0535	1813	0556	1732	0622	1658	0650	1647	8
9	0452	1911	0513	1850	0535	1812	0557	1730	0623	1657	0650	1647	9
10	0453	1910	0514	1849	0536	1810	0557	1729	0624	1656	0651	1647	10
11	0453	1910	0515	1848	0537	1809	0558	1728	0625	1655	0652	1647	11
12	0454	1910	0515	1847	0537	1808	0559	1726	0626	1655	0653	1648	12
13	0454	1909	0516	1846	0538	1806	0600	1725	0627	1654	0653	1648	13
14	0455	1909	0517	1845	0539	1805	0601	1724	0628	1653	0654	1648	14
15	0456	1909	0518	1844	0539	1803	0601	1723	0629	1653	0655	1648	15
16	0456	1908	0518	1843	0540	1802	0602	1721	0630	1652	0655	1649	16
17	0457	1908	0519	1841	0541	1801	0603	1720	0631	1652	0656	1649	17
18	0458	1907	0520	1840	0541	1759	0604	1719	0632	1651	0657	1650	18
19	0458	1907	0520	1839	0542	1758	0605	1718	0633	1651	0657	1650	19
20	0459	1906	0521	1838	0543	1756	0606	1717	0634	1650	0658	1650	20
21	0500	1905	0522	1837	0544	1755	0606	1715	0635	1650	0658	1651	21
22	0500	1905	0523	1835	0544	1754	0607	1714	0636	1649	0659	1651	22
23	0501	1904	0523	1834	0545	1752	0608	1713	0637	1649	0659	1652	23
24	0502	1904	0524	1833	0546	1751	0609	1712	0637	1649	0700	1653	24
25	0502	1903	0525	1832	0546	1749	0610	1711	0638	1648	0700	1653	25
26	0503	1902	0525	1830	0547	1748	0611	1710	0639	1648	0700	1654	26
27	0504	1902	0526	1829	0548	1747	0611	1709	0640	1648	0701	1654	27
28	0504	1901	0527	1828	0549	1745	0612	1708	0641	1647	0701	1655	28
29	0505	1900	0528	1827	0549	1744	0613	1707	0642	1647	0702	1656	29
30	0506	1859	0528	1825	0550	1742	0614	1706	0643	1647	0702	1656	30
31	0507	1858	0529	1824			0615	1705			0702	1657	31
Average Twilight Civil:		Average Twilight Civil:		Average Twilight Civil:		Average Twilight Civil:		Average Twilight Civil:		Average Twilight Civil:		Average Twilight Civil:	
29 min.		26 min.		25 min.		25 min.		27 min.		28 min.			
Nautical:		Nautical:		Nautical:		Nautical:		Nautical:		Nautical:		Nautical:	
63 min.		58 min.		55 min.		54 min.		57 min.		59 min.			

Retain for use in future years. These data valid through 2020.

**TABLE C-3 Sunrise and Sunset for Barking Sands (January-June)**

Sunrise, Sunset, and Duration of Twilight for Barking Sands, Kauai, HI  
(January to June)  
22°02' N, 159°47' W

Note: All times are Alaska-Hawaii Standard Time. (150th Meridian)

Date	January		February		March		April		May		June		Date
	Sun- rise	Sun- set	Sun- rise	Sun- set	Sun- rise	Sun- set	Sun- rise	Sun- set	Sun- rise	Sun- set	Sun- rise	Sun- set	
1	0718	1807	0718	1828	0700	1843	0632	1854	0607	1905	0555	1919	1
2	0719	1808	0717	1829	0659	1843	0631	1855	0607	1906	0555	1919	2
3	0719	1809	0717	1830	0659	1844	0630	1855	0606	1906	0555	1920	3
4	0719	1809	0716	1830	0658	1844	0629	1855	0606	1906	0555	1920	4
5	0719	1810	0716	1831	0657	1845	0628	1856	0605	1907	0555	1920	5
6	0720	1811	0715	1831	0656	1845	0627	1856	0604	1907	0555	1921	6
7	0720	1811	0715	1832	0655	1846	0627	1856	0604	1908	0555	1921	7
8	0720	1812	0714	1833	0654	1846	0626	1857	0603	1908	0555	1921	8
9	0720	1813	0714	1833	0653	1846	0625	1857	0603	1909	0555	1922	9
10	0720	1813	0713	1834	0653	1847	0624	1857	0602	1909	0555	1922	10
11	0720	1814	0713	1834	0652	1847	0623	1858	0602	1909	0555	1922	11
12	0721	1815	0712	1835	0650	1848	0621	1858	0601	1910	0555	1923	12
13	0721	1815	0712	1835	0650	1848	0621	1858	0601	1910	0555	1923	13
14	0721	1816	0711	1836	0649	1848	0620	1859	0600	1911	0555	1923	14
15	0721	1817	0710	1836	0648	1848	0620	1859	0600	1911	0555	1924	15
16	0721	1818	0710	1837	0647	1849	0619	1859	0559	1912	0555	1924	16
17	0721	1818	0709	1837	0646	1849	0618	1900	0559	1912	0556	1924	17
18	0721	1819	0709	1838	0645	1850	0617	1900	0559	1913	0556	1925	18
19	0721	1820	0708	1838	0644	1850	0616	1900	0558	1913	0556	1925	19
20	0720	1820	0707	1839	0643	1850	0615	1901	0558	1914	0556	1925	20
21	0720	1821	0706	1839	0642	1851	0615	1901	0558	1914	0556	1925	21
22	0720	1822	0706	1840	0641	1851	0614	1902	0557	1914	0557	1925	22
23	0720	1822	0705	1840	0641	1851	0613	1902	0557	1915	0557	1926	23
24	0720	1823	0704	1841	0640	1852	0612	1902	0557	1915	0557	1926	24
25	0720	1824	0703	1841	0639	1852	0612	1903	0557	1916	0557	1926	25
26	0719	1824	0703	1842	0639	1852	0611	1903	0556	1916	0558	1926	26
27	0719	1825	0702	1842	0637	1853	0610	1904	0556	1917	0558	1926	27
28	0719	1826	0701	1843	0636	1853	0609	1904	0556	1917	0558	1926	28
29	0719	1826	0701	1843	0635	1853	0609	1904	0556	1917	0558	1926	29
30	0718	1827			0634	1854	0609	1904	0555	1918	0559	1927	30
31	0718	1828			0633	1854	0608	1905	0555	1918			31
	Average Twilight Civil: 24 min. Nautical: 51 min.		Average Twilight Civil: 23 min. Nautical: 49 min.		Average Twilight Civil: 22 min. Nautical: 45 min.		Average Twilight Civil: 23 min. Nautical: 50 min.		Average Twilight Civil: 24 min. Nautical: 53 min.		Average Twilight Civil: 25 min. Nautical: 55 min.		

Retain for use in future years. These data valid through 2020.

**TABLE C-4 Sunrise and Sunset for Barking Sands (July-December)**

Sunrise, Sunset, and Duration of Twilight for Barking Sands, Kauai, HI  
 22°02' N. 159°47' W  
 (July to December)

NOTE: All times are Alaska-Hawaii Standard Time (150th Meridian)

July		August		September		October		November		December			
Date	Sun- rise	Sun- set	Sun- rise	Sun- set	Sun- rise	Sun- set	Sun- rise	Sun- set	Sun- rise	Sun- set	Sun- rise	Sun- set	Date
1	0559	1927	0611	1919	0622	1856	0630	1827	0643	1802	0702	1755	1
2	0559	1927	0612	1919	0622	1855	0631	1826	0643	1802	0702	1755	2
3	0600	1927	0612	1918	0623	1854	0631	1825	0644	1801	0703	1755	3
4	0600	1927	0612	1918	0623	1853	0631	1824	0645	1801	0703	1755	4
5	0600	1927	0613	1917	0623	1852	0632	1823	0645	1800	0704	1755	5
6	0601	1927	0613	1916	0623	1851	0632	1822	0646	1800	0705	1756	6
7	0601	1927	0614	1916	0624	1850	0632	1821	0646	1759	0705	1756	7
8	0602	1927	0614	1915	0624	1849	0633	1820	0647	1759	0706	1756	8
9	0602	1926	0614	1914	0624	1848	0633	1819	0647	1758	0707	1756	9
10	0602	1926	0615	1914	0625	1847	0633	1819	0648	1758	0707	1757	10
11	0603	1926	0615	1913	0625	1846	0634	1818	0649	1758	0708	1757	11
12	0603	1926	0616	1912	0625	1845	0634	1817	0649	1757	0709	1757	12
13	0603	1926	0616	1912	0625	1844	0634	1816	0650	1757	0709	1758	13
14	0604	1926	0616	1911	0626	1843	0635	1815	0650	1757	0710	1758	14
15	0604	1926	0617	1910	0626	1842	0635	1814	0651	1756	0710	1758	15
16	0605	1925	0617	1909	0626	1841	0636	1813	0652	1756	0711	1759	16
17	0605	1925	0617	1909	0626	1840	0636	1813	0652	1756	0712	1759	17
18	0606	1925	0618	1908	0627	1839	0636	1812	0653	1756	0712	1800	18
19	0606	1925	0618	1907	0627	1838	0637	1811	0654	1755	0713	1800	19
20	0606	1924	0618	1906	0627	1837	0637	1810	0654	1755	0713	1800	20
21	0607	1924	0619	1905	0628	1836	0638	1810	0655	1755	0714	1801	21
22	0607	1924	0619	1905	0628	1836	0638	1809	0656	1755	0714	1801	22
23	0608	1923	0619	1904	0628	1835	0639	1808	0656	1755	0715	1802	23
24	0608	1923	0620	1903	0628	1834	0639	1807	0657	1755	0715	1803	24
25	0608	1922	0620	1902	0629	1833	0639	1807	0658	1755	0716	1803	25
26	0609	1922	0620	1901	0629	1832	0640	1806	0658	1755	0716	1804	26
27	0609	1922	0621	1900	0629	1831	0640	1805	0659	1755	0716	1804	27
28	0610	1921	0621	1859	0630	1830	0641	1805	0700	1755	0717	1805	28
29	0610	1921	0621	1859	0630	1829	0641	1804	0700	1755	0717	1805	29
30	0610	1920	0621	1858	0630	1828	0642	1803	0701	1755	0718	1806	30
31	0611	1920	0622	1857		0642	1803				0718	1807	31
Average Twilight Civil:		Average Twilight Civil:		Average Twilight Civil:		Average Twilight Civil:		Average Twilight Civil:		Average Twilight Civil:		Average Twilight Civil:	
23 min.		23 min.		22 min.		23 min.		24 min.		24 min.		24 min.	
Nautical:		Nautical:		Nautical:		Nautical:		Nautical:		Nautical:		Nautical:	
54 min.		50 min.		48 min.		49 min.		51 min.		52 min.		52 min.	

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